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GENTLEMEN: The subject-matter of the remarks to be presented this morning was suggested to me by an article published in the *British Medical Journal*, in 1882, from the pen of "that good man among men, and great man among doctors"—J. Marion Sims. The article in question was an appeal for operative interference in penetrating gunshot wounds of the abdomen, in lieu of the "expectant treatment" so universally accepted and adopted by the profession, and which, in a few seemingly well-authenticated instances, has led to recovery. The appeal was uttered in behalf of the vast majority on the side of fatality attending these cases, and was based upon the deductions to be drawn from the recoveries, following operations for diseases affecting the viscera of the abdomen and pelvis, during which the most terrible injuries have been inflicted upon the contents of these cavities—the peritoneum exposed for hours, as well as brought in contact with all kinds of foreign and usually irritating substances.

It is scarcely necessary for me to affirm in your presence the fact that, with few exceptions, the older writers and surgeons advocate the "expectant treatment" in the management of these injuries, while the younger writers and surgeons favor operations, pinning their faith upon the wonderfully favorable results attending the practice of Listerism, the purest of antiseptic surgical methods.

During the past few months I have instituted and carried out, with the valuable assistance of Mr. J. McDill, and Drs. Anthony, Freer, and Bolles, a series of experiments for the purpose of ascertaining the results to be obtained by immediate operations after these wounds; with the hope that the relation of the attending circumstances and events would be interesting as well as useful, by adding to the data now in our possession other data from which may be determined more intelligently the course of action to be adopted when these cases come under our charge for treatment.

No attempt will be made to review the great question of penetrating gunshot wounds of the abdomen, which would lead me beyond the scope of the paper. Nothing but a fair recital of the history of the experiments, with some application of the conclusions to be drawn therefrom, will be undertaken. With this intent in view, there will be presented to you the accompanying phenomena, the manner of treatment, and results of thirty-seven intentional gunshot wounds of the abdomen, confining my attention entirely to my own observations and exhibiting to you such specimens as I have been able to preserve, taken from the animals, both of those which died and of those which were sacrificed, after recovery, to obtain the specimen. Experiments of like nature have been made upon animals by very many surgeons previous to the application of their convictions of the necessity of certain procedures to relieve disease or the effects of injury in the human body. No preparation of the animals selected for experiment was made, either as to choice of physical condition or surrounding circumstances, except that they were anæsthetized previous to being hurt. The wounds were produced by the ordinary Smith and Wesson revolver of 22, 32, 38, and 44 calibre, and by the 22 calibre rifle. The shots were given at short range, so the damage done by the bullet fairly represents the injury met with, either in military or civil practice, as the results of shots from the firearms now in use. At first, no attempt was made to give a definite direction to the course of the bullet other than that it should perforate the abdominal cavity. The results soon confirmed the fact so well known, that the larger number of patients suffering from such wounds never come into the hands of the surgeon, their injuries proving rapidly fatal.

This ending, we can readily understand, must be a common one when we bear in mind the construction and nature of the viscera contained in the cavity, especially their great vascularity, having vessels of immense size supplying them with and carrying away from them the blood necessary for their nutrition and the performance of their special functions; not to mention the main systemic artery and vein coursing through the cavity in a position rendering them readily liable to perforation, death following speedily.

It was also soon ascertained that a severe perforating and lacerated bullet wound of the viscera, such as of the kidneys, of the spleen, and of the pancreas, could not apparently be treated successfully in any other way than by an absolute removal of the injured organ, and notwithstanding the reported successful removal of almost every important organ of the abdomen by one surgeon or another, the conclusion was reached that some of these organs must be left in situ, in order that the functions of life may be carried on. Hence we were compelled to exert such control over the course of the missile as to have it produce a wound of the nature of those likely to come, and actually coming, under the care of the surgeon. So that the injuries became those confined to perforations and injury of the intestinal tube, with occasionally the injury of some of the larger special organs. It will not be amiss to recall to your minds, very briefly, some of the triumphs of abdominal surgery, and more especially to impress the fact that shot wounds of the cavity and contents present many questions of prime importance which are not met with in, and do not complicate, ordinary operations for disease or injury with any free external wound. The removal of the spleen for acute wounds nearly always results in recovery; so also one kidney has been removed successfully, either for disease or injury, often

enough to place the operation of nephrectomy among the list of justifiable undertakings. Again, wounds of the intestinal tube of all degrees of severity, up to complete division by the resection of portions of the entire calibre thereof, have been successfully treated by surgeons, as is proved by the experimental researches of Dr. Traverse, the eminent Prof. S. D. Gross, Dr. Bell, and others, and confirmed by the experience of many surgeons during operations upon the human being for diseases of these cavities. Still, in each of the examples mentioned, the circumstances were entirely different from what is found present in perforating gunshot wounds of the abdomen. In the former, the peritoneal cavity was clear of blood and other extraneous substances; the prevention of their entrance entirely under the control of the operator. In the latter, blood in large amounts was always found present, and the peritoneum was smeared with the contents of the intestinal tube, necessitating prolonged efforts to secure a cavity clear of all hurtful substances. Of necessity, the latter cases would be least likely to escape the probabilities and dangers of subsequent inflammation of the serous membrane.

Primary resection of portions of the intestinal tube, or entire removal of separate organs, are operations comparatively easy of performance, and are not necessarily attended with any damage to or exposure of any other portions of the abdominal cavity, outside of the immediate proximity of the site of the operation. Extravasation and hemorrhage should be entirely prevented and controlled; and the peritoneal sac can be maintained perfectly clean during the time of, and after, all the procedures required by the operation. After gunshot wounds, besides the resection or removal of any special organ required, there is great shock, and prolonged manipulation is necessary to obtain a proper cleanliness.

The recital in detail of each experiment would be tiresome and occupy too much time, so that your attention will be called only to the more important facts and circumstances determined by them. There will be published with the paper a somewhat extended account of each experiment, from which individual inferences may be drawn.

First comes the question of hemorrhage and damage to bloodvessels, as this is primarily the most common and certain cause of death, and demands the surgeon's first attention. In its excessive amount, occurring rapidly and suddenly, is to be found the explanation of the cases which are immediately fatal. This result will surely happen when the largest arterial trunks are severed by the bullet; further, its copiousness and persistency of flow, even when none but very small bloodvessels are divided, involve a matter of serious concern, if not a fatal issue, either from the amount of blood lost, or in predisposing to septic processes from blood decomposition. There is a remarkable persistency in the flow of blood following the severance of vessels in the abdominal cavity, perhaps dependent upon the laxity of the tissues through which these vessels course, the absence of pressure from surrounding soft parts, and the lack of the peculiar influence of the atmosphere, either from its weight or clot-producing power.

When the abdomen is opened immediately after the transit of a bullet, its cavity is found to contain a large amount of blood, the quantity, of course, being in proportion to the size of the vessels wounded, but always a disproportionately large amount, no matter what their calibre; further, the flow is still going on from vessels of all size. There seems to be slight disposition to the formation of an obstructive clot in the mouths of the smaller ones, and slow retraction or contraction of the walls of the larger. Bleeding stops only when the heart ceases to beat in a faint from excessive loss, or when the amount of blood is so large that by its bulk, and weight, and distention of the abdominal walls, it makes pressure sufficient to occlude the open vessels.

The conditions are very quickly altered after air is admitted through the abdominal section. Clots rapidly seal up the smallest vessel; the smaller arteries spurt less forcibly and soon cease beating; the larger ones contract and retract, just as occurs in the wounds of soft parts in other regions of the body. This is in accordance with and corroborative of the experience in hemorrhages occurring in abdominal surgery in the human being. Few of us have failed to see cases like this: A patient dies suddenly, with all the symptoms of acute prostrating hemorrhage. Post-mortem examination shows the abdominal cavity filled with blood. The blood is carefully cleared away in the search for the source whence it came; and when this is found, it is a matter of astonishment that such a vast amount of blood could come from so small a vessel. Perhaps it is a small vein of the ovarian venous plexus, or a minute vessel in the thin-walled sac of an extrauterine fœtation, or the partially closed vessels in the shrunken stump of a recently removed ovarian or other tumor, or some recently divided adhesions—all of them vessels which, in any other part of the body, would be no item of concern to the surgeon, or need any of his special care to prevent bleeding from them.

The lesson taught by these facts is of imperative importance in all operations upon these cavities; and, even if mastered, loses nothing by reiteration. Excessive hemorrhage being certainly the principal cause of speedy death in severe gunshot wounds in this region of the body, where evidences of its presence are plainly exhibited there can be no hope whatever of saving the lives of any of the wounded except by immediate abdominal section. This alone, by admitting air quickly, staunches the fast flowing current, and gives time for the application of the ordinary rules of surgery for the prevention of hemorrhage. In order to be safe from subsequent trouble, every divided bloodvessel must receive the surgeon's attention, occluding clots must be thoroughly sponged away, and in their stead must be placed the ligature or the sear of the actual cautery. If left without this restraint and the abdominal opening be closed, the same conditions are restored as existed previous to the section; and, as reaction comes on, bleeding will surely recur, and in large amount—leading to death from this cause alone, or furnishing a frequent source of septicæmia. This fact, again, is corroborative of the experience of ovariotomists, the most successful being those who take the greatest pains to staunch all bleeding before closing the abdomen.

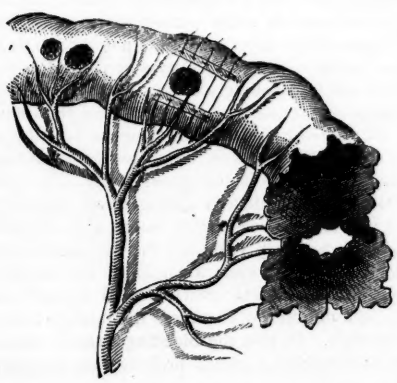
Following a resection of three or four inches of bowel and a ligation of two large mesenteric arteries wounded by the bullet, there occurred a mortification of several inches of the entire intestine above the site of resection.

The mortified part corresponded with the distribution of the arteries wounded and ligated. This, assuredly, was an important fact to know, if at all likely to occur as the result of wounds of these arterial branches; even its accidental occurrence is a circumstance to be remembered. Its occurrence would surely add largely to the gravity of the cases in which it happened, probably necessitating a resection of a portion of the intestine corresponding to the area of distribution of the wounded vessel. The great freedom of anastomosis between the mesenteric arteries rather argues against their wounds being followed by any such hazardous result; still, the case recorded above required explanation. Two experiments were performed in order to determine whether destruction of the arteries alone was sufficient to lead to such mortification. Both demonstrated that a closure of two or three of the largest subdivisions of the main mesenteric vessel was not in itself sufficient to produce death of the portion of intestine supplied by them.

The complication of a complete resection of the bowel, with a ligation of two or more vessels, is the only explanation to be given of the case in which mortification occurred. The experiments prove that such result does not follow simple closure of the vessels by ligation.

The second item to be considered refers to the course of the bullet, and the character of the damage done by it. Nothing can possibly be more uncertain and erratic than the track of the missile through the body. A contracting muscular fibre, an edge of fascia, the elasticity of the skin, a surface of bone, or a distended knuckle of intestine, each and all of these at times present obstruction sufficient to divert it from the direct line of its flight. It is certainly astonishing what very extensive and severe lacerations of the intestine are produced by so small a bullet as one of calbre No. 22 (Fig. 1), the

FIG. 1.



entire circumference of the bowel at some points being mangled beyond recognition. Again, it is equally surprising how minute are the perforations made by the large No. 44. As a rule, the larger the calibre of the bullet the larger the wound.

An estimate of the direction of transit, based upon the points of entrance and exit, is purely conjectural, and furnishes no standard whatever by which we may judge of any supposed injury to any organs known to lie in such course. In one experiment the bullet made four openings through the abdominal walls, and did no damage other than contusion of two knuckles of the small intestine, and gouging the serous membrane. The animal had a remarkably deep furrow along the course of the "linea alba." The bullet entered the right side of the abdomen obliquely, two inches from the midline, perforated its walls, and, coursing to the left, furrowed the peritoneum in its passage, and was evidently deflected outwards immediately before reaching the linea alba, by a knuckle of intestine which it contused slightly. Here it made its first exit through the walls, passed to the left side of the midline, again perforated the abdominal walls, and, furrowing the peritoneum upon the left side, finally made its second exit through the abdominal walls three inches to the left of the linea alba. Near its place of final exit a second knuckle of intestine was found badly contused. The contusion was so severe and extensive that it was thought best to resect a length of one inch. The animal recovered.

In a second instance the bullet entered the cavity about two inches to the right of the linea alba, on a line with the umbilicus, with a direction upwards and to the left side. It made its exit nine inches to the left of the midline, and just at the lower edge of the last rib. On opening the abdomen the stomach was found greatly distended, entirely concealing the other viscera from view, and presented two large perforations in its walls about two inches apart, from which some blood, mucus, and food were found running into the peritoneal sac. The wound to the right, in the stomach walls, was the smaller and situated directly opposite the entrance perforation in the abdominal wall, having the same direction. The wound to the left in the stomach walls (two inches to the left) was the larger, very ragged, and had evidently been made by the bullet deflected forward at its first entrance into the stomach. After leaving the stomach the bullet impinged upon the inside of the abdominal walls just to the left of the midline, and then, instead of perforating them at that point, was again deflected upwards and to the left, merely furrowing the peritoneum along the remainder of its course to the point of exit mentioned. The wounds of the stomach were inverted, as it were, into the cavity of that organ, by bringing its peritoneal surfaces surrounding the wounds in contact with each other by means of the continued catgut suture. The abdomen was carefully cleansed of blood, etc., and the wounds in the walls closed in the ordinary way. The animal speedily recovered from the injury without any uncomfortable symptoms. During recovery from the effects of the ether, the animal vomited considerable quantities of blood, giving an additional evidence of the perforation of the stomach.

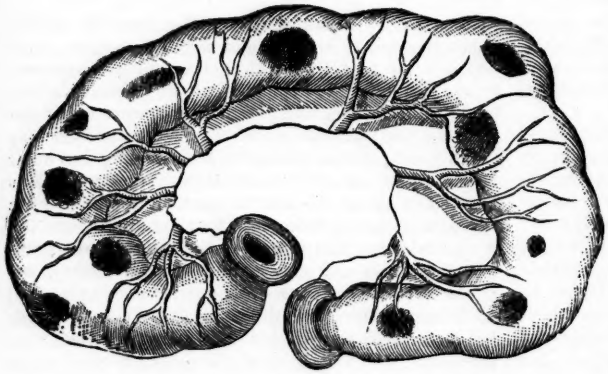
There were two cases in which the bullets perforated the abdominal walls, and in their transit did no injuries to the viscera, and in which the points of entrance were five and six inches apart. In each instance the only damage done was a furrowing and laceration of the peritoneum along their entire courses, the blood from the track of injury falling into the abdominal cavity. In one experiment the bullet failed to penetrate the abdominal walls, and was subsequently dissected from between the muscles. On opening the cavity quite a rent was found in the spleen, opposite to the seat of

the external bullet wound, from which blood was freely flowing. There was neither abrasion nor perforation of the peritoneum. This case may suggest the probable cause of death in some cases from non-perforating wounds. The laceration was evidently caused by concussion alone.

Other instances might be cited to illustrate the exceedingly great uncertainty as to the course taken by the bullet, and as to the organs probably impaired. They would also confirm the possibility of perforations of the walls without accompanying injury to the contents of the abdomen. Still, no instance was shown of failure to produce a wound thereof when the bullet's course lay among the intestines. Their safety followed deviation by glancing.

The wounds of the intestine may be many in number and situated very near to each other (Fig. 2), so that

FIG. 2.



one resection, including all the openings, will constitute the only operation that furnishes relief.

Again, the openings may be few in number and widely removed from each other; and if each wound is large, and the damage to the tube extensive, such as is usually produced by a 32, 38, or 44 calibre bullet, three or four resections are necessary. The latter are the most difficult cases to manage and most fatal in their results. The position of the point of entrance and exit of the bullet in the intestine is subject to immense variety even in simple cases. It may involve only the top of a knuckle of intestine, merely opening the cavity thereof. The points may be so near each other that only a half inch or less of intestinal wall separates them from each other. The bullet may merely cut off the mesenteric junction opening into the cavity more or less freely. The intestine is often perforated transversely near the middle, or longitudinally; in the latter case, the bullet entering at one point, courses along in the cavity of the tube for some inches and then makes its exit.

All of these varieties depend upon the situation of the intestinal folds, with reference to each other, at the time of the transit of the bullet. One case showed ten complete perforations in eighteen inches of length of the ileum.

Extravasation of the contents of the tube was present in every instance in which there existed the slightest degree of perforation. The contents were forced out into the peritoneal cavity or on to the surface of the intestines, if the wound was large, by the bullet itself and the normal tonic contractions of the bowels, and, if small, perhaps by the latter alone. This facility of extravasation agrees with my experience in wounds of the intestine in the human being. I have personal knowledge of two instances in which the medium sized aspirator needle was employed to relieve tympanitic distention of the tube with success, so far as getting rid of the gas was concerned, and giving great temporary comfort to the patient. Death ensued from the disease. Post-mortem examination in each case demonstrated the presence of fecal extravasation at the seat of the needle puncture. It would not be an arduous task to collate instances of this accident, in the practice of others, where this plan has been adopted. It is difficult to understand how any other result could follow a perforation, if there be contents at the seat of the puncture, when we remember how strong and constant is the action of the circular muscular fibre. It is stated that the protrusion or eversion of the mucous coat, which ensues very rapidly after complete division of the walls, acts as an immediate stopper to wounds of small size, say one-eighth of an inch in diameter. This may be true in incised wounds, but it was not shown to exist in a single one of the several hundred perforations coming under my inspection as made by the bullet. The latter tears away and lacerates the parts through which it passes, and perhaps paralyzes the muscular fibre in its immediate neighborhood, but, whatever the cause, there was no instance in which the eversion of the mucous membrane was sufficient to prevent extravasation. Recognizing the very deleterious influence of this material upon the peritoneal membrane, this fact of the great certainty of extravasation adds another point to the argument in favor of abdominal section in these cases, as furnishing the only means by which this source of trouble can be absolutely eliminated. As part of the extravasated material from the wounds of the intestine, it was an exceedingly common thing to find intestinal worms of all kinds and in large numbers, protruding from the rents or free in the serous cavity.

In the treatment adopted during these experimentations, it was found necessary to make an extensive external incision, freely exposing the abdominal cavity, in order that all the viscera might be thoroughly and carefully examined, and every wound brought within reach. In a majority of instances the median line gave space enough. In two, the bleeding vessels could not be reached without a lateral prolongation towards the flanks.

There was no reason to suppose that the extent of the incision added very much, if at all, to the gravity of the operation. After opening the abdomen, the intestines were all turned out, critically examined for perforation or contusion, the situation of these fixed, and the hemorrhage therefrom controlled by means of the snap forceps; after which, wounds of special organs were sought for. If the substance of the spleen or the kidney was found perforated, the organ was immediately removed after ligating its bloodvessels, the stump being

returned to the abdomen. If slight lacerations only at some point on the surface had been produced, these were closed by bringing peritoneal surfaces of the organ over the wound by means of the continued suture.

The peritoneal sac was then carefully and thoroughly cleared of blood and other extraneous substances by repeated sponging or irrigation. The intestines, which during this process had been protected by being enveloped in towels wrung out of warm water, were now cleanly sponged, while all unwounded portions were returned to the abdomen.

It seems to be of little consequence whether or not the intestines be returned to the cavity in any definite order—in fact, it is doubtful whether they are ever returned precisely to the same positions they originally occupied before being disarranged during the operation. Still, some care must be used in order to avoid the accident which happened in one experiment. After the divided ends of the intestine had been united, it was found that during the manipulation one of the ends had in some way been passed through an opening in the divided mesentery, so as to produce a figure-of-eight convolution in the tube. It was left in this shape. The animal recovered, and I have the specimen with me to demonstrate the perfectness and security of the union in the intestine at the place of reunion. The animal was sacrified, to secure the specimen, six weeks after the operation. The abdominal cavity was quite free from evidences of inflammation, except where those misplaced folds lay in contact with each other; at this point, slight peritoneal adhesion had formed between them.

FIG. 3.

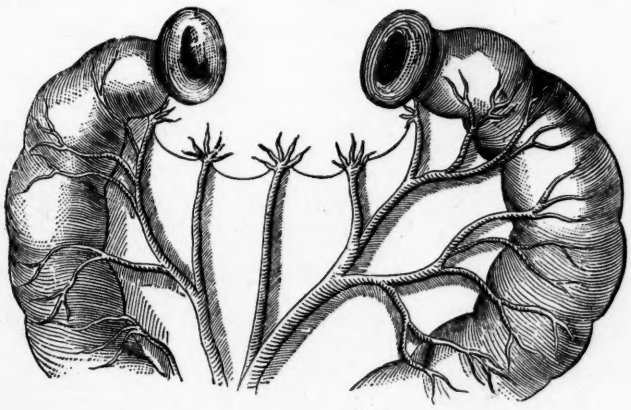
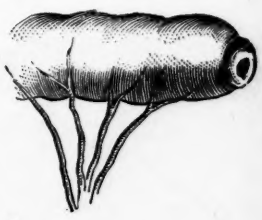


FIG. 4.



Where several wounds occurred rather close together, severe enough to destroy a considerable portion of the integrity of the bowel, one resection was made to include all of them, even when the length of intestine removed measured ten inches or more. Where the points of injury were widely separated from each other, and extensive damage done at each point, several resections, of a length of the tube, just sufficient to include the injured portions, were made. In the former case, in which several inches or more of the tube were taken away, the mesentery was ligated as close as practicable to the intestine (Fig. 3), in sections corresponding to the number of bloodvessels going through it to the resected portions. The mesentery was then divided close to the intestinal wall. After this, the tube itself was separated and the wounded portion removed. One artery always needing ligation was found in the divided ends, at the point of junction of the mesentery with the intestine. Or a triangular section of mesentery removed with the point of the triangle away from the bowel. Before the final division of the intestine, its contents were pushed back out of the way, and compression exercised upon its walls by a pair of forceps or a temporary ligature, in order to prevent extravasation of its contents through the divided ends. The mark of constriction made by the forceps or ligature used to close the lumen of the bowel was to be plainly seen several days after the operation. The safest compression can be made by an assistant's fingers. Results soon demonstrated the paramount necessity of carefully selecting the place for final division of the intestine, in order to avoid sloughing of the edges approximating together, the results being best in those cases in which the division was made close to the point at which any given mesenteric artery approached nearest to the intestine, as compared with those in which the cut was made in the intervals between any two branches of these vessels, and this was seemingly dependent on the better supply of blood belonging to the former cases. Immediately after division of the intestine, there followed an instantaneous, regular, and considerable contraction of the calibre of the tube (Fig. 4) close up to the divided edge, caused by the action of the circular muscular fibre. The diameter was often diminished more than half by this contraction (Figs. 1, 2, and 3). This persisted for a time, but was soon followed by an eversion of the mucous membrane, which rolled out and over the constricted portion in a remarkable manner (Fig. 3).

This protrusion of the mucous membrane forms a serious obstacle to easy and close approximation of the ends of the bowel in the efforts to bring them together by sutures; and, when turned into the bowel during such procedure, diminishes its calibre considerably, although it was not demonstrated that the obstruction was ever sufficient to prevent the passage of the intestinal contents. Several efforts were made to get rid of it, and

overcome the seeming delay caused by its presence, but all these were finally abandoned. It was pared away with the scissors; it was dissected up from the other coats for a quarter of an inch from the edges, but the conclusion was finally reach that, instead of being a harm, its presence was useful in giving support, protection, and perhaps vascularity to the freshly sutured edges; at least, in all instances in which it was removed, the stitches were found torn out and union defeated. In no case in which it was left entire, did there fail to be union in some part, and no sutures gave way when properly applied.

In all instances in which a single perforation was severe enough to require a resection of the wounded part, it was found advantageous to leave, if possible, a strip of the bowel near the mesenteric junction (Fig. 5), taking out the

FIG. 5.

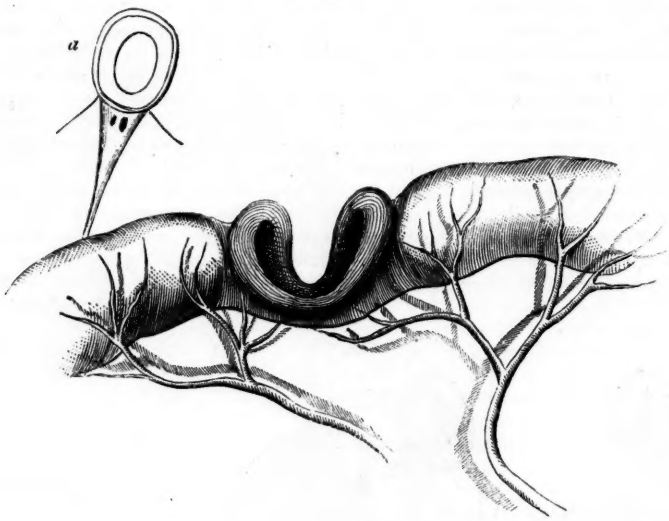
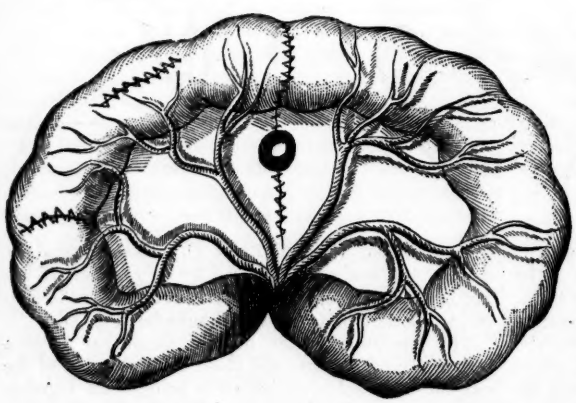


FIG. 6.



wounded portion by means of a V-shaped incision. The part left acted as a support to the wound; avoided division of the bloodvessels at this point; opposed the action of the longitudinal fibres, and in no instance in which this plan was adopted was there any appearance of separation of the wound or any displacement of stitches. In perforations through the stomach, the wound did well after drawing the peritoneal surfaces some distance from the edges thereof, over it (Fig. 6), by means of the continued suture, thus converting it into a linear wound. The same plan was adopted with success in abrasion and small perforations in the small intestines.

This way of treating the bullet openings in the bowel, is susceptible of much wider application than would appear possible at the first glance. I am quite well satisfied that it will safely take the place of excision, in not a few cases of quite severe injury. The torn edges of the wound can be turned in and peritoneal surfaces fastened together, even in large wounds, with perfect confidence in the result of safe and secure adhesion following. It seems probable that by far the greater number of successful cases will follow a single resection, even if that include a number of perforations, and involves eight or ten inches of bowel, in comparison with those cases in which several excisions are made of wounded portions widely separated.

Perforations passing through the mesenteric surface of the intestine were found the most difficult to treat, and even if slight seemed always to require a complete excision. A partial excision of this surface of the bowel resulted in an acute-angled elbow which never did well. The point of attachment of the mesentery with the bowel will usually be found the most troublesome to manage in applying the sutures in restoring a complete division. (Fig. 5, *a*.) It is quite difficult so to place the sutures as to secure a perfect reinversion of the mucous membrane, to bring serous surfaces fairly in contact with each other, and to get a sound junction.

The difficulty arises apparently from the manner in which the folds of peritoneum separate from each other

before passing on to invest the bowel, leaving a little triangular interval filled with loose connective tissue, fat, and bloodvessels. Now, if the suture fails to include the muscular coats of the intestine as well as the peritoneum at this point, the junction will surely give way and extravasation result. To make this point secure the greatest possible care must be taken in placing at least three sutures, this number being usually quite enough to include the troublesome area, and these should always be the first sutures applied. In placing the remaining sutures to complete the junction, after placing the three sutures mentioned at the mesenteric surface, it assists materially in the ease of application, saves time, and especially avoids trouble from the everted mucous membrane, to apply one at the most convex surface, and then one, half way down, on each lateral surface. After this is done the remainder can be introduced easily and rapidly. If introduced in a regular series, one after the other, all the way round, it is a very slow process, the mucous membrane is always in the way, the needle-openings in the intestines are apt to be uneven, and it is altogether the poorest plan of proceeding. The advantages mentioned as gained by taking the course suggested, are certainly all of them items of importance and have some bearing on the result; at best, these procedures will be found very prolonged and tedious. The material used by us for sutures was silk and catgut, the latter for the continued, the former for the interrupted, ligatures—No. 1 catgut, No. 2 silk. The needles were the full-curved, round needles and the ordinary sewing needle; the latter is the best. The sutures were introduced fully the third of an inch from the divided edges, made to include the peritoneal and muscular coats, and brought out just free of the edge on one side, and were then reintroduced close to the edge, and made to include about the same amount and kind of tissue on the other side, being very sure not to allow the needle to pass into the intestinal cavity. Howse, of London, proved conclusively, in his cases of gastrostomy, that the fact of entrance of the needle into the cavity of the tube, carrying the thread with it, made the difference between success and failure; cases dying from peritonitis and extravasation when the entry occurred, and recovery following when the thread included only the peritoneum and muscular coats.

Again, the everted tissue should be turned in before introducing the needle, so that it will pass through the rim of constriction; if entered too far away from the divided edge, too much tissue is turned into the intestine. When the mucous membrane was turned in and the suture tightened, two broad surfaces of peritoneum were brought in contact. This you will recognize as Lembert's suture (Fig. 6), with one change—Lembert directs that only one and a half line in width of tissue should be taken up by the suture. This amount of tissue will do very well in the closure of small slits, for which it was intended and to which it was applied, but complete resection needs a much firmer hold to withstand the strain of peristaltic movements. The fact is that it makes no difference whatever what kind of suture is used so that the principle of positively securing the application of two broad surfaces of peritoneum in contact with each other is certainly carried out. Jobert's, Gely's, and Czerny's double row of sutures were all given a fair trial; but none of them resulted as well as this. It never failed to be followed by good union when properly applied, with peritoneal surfaces brought together around the entire circumference of the intestine.

The greatest number of mishaps followed drawing the sutures too tightly, which, if done, leads to death of the applied edges and of course to failure. They must be drawn only sufficiently close to bring the surfaces fairly in contact, the subsequent swelling from obstructed circulation will hold the surfaces firmly together until glued to each other by the rapidly forming adhesive material. The interval left by the incurving of the edges of the bowel immediately after the completion of the operation, was found entirely obliterated, and the sutures covered up by effused lymph at the end of twenty-four hours. In one or two instances in which very small openings had been made in the bowel, they were occluded by passing a suture around the perforation, a short distance from its margin, pushing the wound into the cavity of the intestine, and then by tightening the suture the peritoneum was drawn together over it—a very satisfactory plan of procedure where circumstances will permit its application.

The question of the proper disposition to be made of the divided mesentery, after removal of some length of the intestine, is an important one to decide. No plan adopted proved entirely satisfactory. Previous to separation it was ligated in sections, or inclosed by a V-shaped cut (see Fig. 2); the part beyond the ligature is apt to mortify and thus prove a focus for fatal inflammation. The tissue of the mesenteric membrane is not very vascular, and the vitality of the distal portion of the stump is seemingly best provided for by causing it to adhere to surrounding vascular parts. In some cases the stumps were left free in the abdominal cavity; these all did badly, each showing mortification. In others the different sections were all included in one suture and then stitched to the bowel at the seat of operation, making as nearly as possible a continuous surface of mesentery.

These did much better, there being few instances of sloughing. When sloughing occurred it seemed to be dependent upon and to follow a too tightly fastened ligature. This method, above mentioned, of treating the divided mesentery is useful in another way; it gives support to the bowel at the point of resection; maintains the intestine in proper position by preventing bending, and also leaves fewer raw surfaces free in the serous sac. This last, a condition acknowledged to be the frequent source of serious trouble from faulty adhesion to surrounding organs, and from furnishing points from which septic absorption takes place.

A plan of dividing and treating the intestine and mesentery has been suggested to me as a possible improvement on those already noticed. It is really an application of the plan referred to above in single perforations. This is to make the separation through the intestinal walls three-eighths of an inch on either side of the mesenteric attachment, tear away the mucous lining of the retained strip of bowel, and draw the peritoneal surfaces thereof together by the continued stitch. This would avoid division of the bloodvessels going to the bowel, do away with the necessity of using ligatures, and leave no raw surfaces free in the abdominal cavity. The opening formed by its folding together where the

bowel ends are united should be closed by the continued suture.

Bleeding from slight lacerations of the spleen, kidney, or liver, can be controlled with actual cautery, lightly applied, perhaps the very best method to adopt. If the wound is a complete perforation of the body of the organ, the hemorrhage is very great, rendering extirpation of the entire organ apparently the only sure way of surmounting the difficulty.

Quite frequently the entire mass of the greater omentum seemed to require removal. The bullet in transit not only perforated it, here and there, but passed along between its folds as well, leaving injured tissue and blood-clots of considerable size in its track. These clots disseminated themselves in the meshes in such a way as entirely to prevent their removal without tearing the tissue to shreds. When this condition was present in any degree, the mass was amputated, after ligation, in sections. In a few instances, these stumps gave rise to trouble, either from recurring hemorrhage or mortification of distal end.

The circumstances under which these experiments were made, were such that it was absolutely impossible to carry ou full antiseptic appliances. The external incision was treated with iodoform and oakum or absorbent cotton, and with two exceptions healed by first intention. The bullet wounds through the abdominal walls were not probed nor disturbed in any way. Occasionally, when large and much contused, iodoform was poured on them. In only two instances did they suppurate or give rise to any trouble whatever, crusting over and healing rapidly. This result clearly enforces the rule of not disturbing the track of a bullet through the soft parts, unless the most urgent reasons call for interference. The damage of a serious nature is not in the abdominal walls but in the cavity; the nature of it can be better ascertained and the most satisfactory treatment adopted, after section through the linea alba, rather than by enlargement of the wounds of exit or entrance, if any surgical interference be instituted.

In gunshot wounds of any part of the body it is not the injured muscular tissue or fascia that causes grave concern, but the torn arterial trunk, or severed nerve, or fractured bone made by the missile, and here, too, incisions out of the course of the bullet-track often furnish the best exposure of the parts for manipulation.

None of the wounds of entrance were perpendicular to the surface of the abdomen. All were more or less obliquely directed through the component tissues of the walls, so that they were valve-like in character, and tended to close spontaneously. None of the cases presented any extravasation of the contents of the intestines through the external wounds, notwithstanding the lacerations of the tube were often very extensive, and considerable quantities of fecal matter were found in the peritoneal sac. The conclusion naturally follows that the discharge of such matters through the external openings is not of frequent occurrence after the wounds under consideration. The absence thereof is far from being proof of the non-occurrence of perforation of the intestine.

It can scarcely be expected that extravasation through the wounds in the abdomen will often happen as an immediate occurrence. This is most likely to occur, if present at all, several days after the injury, following adhesion of the bowel to surrounding parts, and the accumulation of considerable quantities of matter. There is no reason to suppose that interference with the adhesions to be met with in operations done some time after the injury, would be followed by any worse consequences than that which follows their disruption during the performance of operations for ovarian or other tumors. The hazard supposed to attend their severance is certainly exaggerated. With a clean cavity they will do equally well in all cases.

These experiments have not developed any data which will aid in the positive diagnosis of the severity or extent or kind of injury done to the viscera, or render such diagnosis less difficult than heretofore, previous to abdominal section. They go a step in advance of this by supporting the assertion that it is absolutely useless to expect immunity from penetrating injury of the intestine when the bullet has traversed the cavity. It seems —and is—infinitely more reasonable to subject the patient to the slight risk of an abdominal section, showing unwounded intestines, than to allow him to pass through the fearfully deadly peril of wounded intestines unrelieved, on the barren supposition that they may have escaped injury.

Some uncertainty is likely to arise, except in those cases showing extravasation of the contents of the bowel, or those in which the free loss of blood, as indicated by the usual symptoms accompanying such accidents, calls for aid. When doubt exists, and a critical condition of the patient argues severity of lesion, abdominal section surely seems to promise relief that can come in no other way. Exploratory incision of the abdominal walls has been done so often, and with so little hazard, as to entitle it to be classed as a procedure in itself almost destitute of danger. Such a conclusion is certainly supported by the results developed during these trials. The rule was, no trouble whatsoever from this incision.

No deduction can more justly or positively follow, as the result of these experiments, than that an incision *de novo*, through the linea alba, is the best method of procedure in the treatment of the class of wounds under consideration; a plan far preferable to enlarging either of the openings made by the bullet. It at once gives command over the entire cavity, therefore any lesion likely to result in harm is far less liable to be overlooked. It is the least vascular part of the walls; incisions thereof are more easily and perfectly coaptated than elsewhere, heal readily and soundly, and, as a consequence, the oncoming cicatrix is less likely to be followed by ventral herniæ.

39 animals were used in these experiments, exclusive of those dying from the effects of the anæsthetic. 2 of the 39 were used to demonstrate the effects of closure of the main branches of the mesenteric artery upon the nutrition of the intestines. Of the remaining 37, 3 cases died immediately after the shot, or from the effects of profuse hemorrhage, one having a division of the aorta just below the mesenteric artery; the second had a large laceration of the kidney, with a wound of the renal artery; the third, a laceration of both kidney and spleen. One case, No. 4, had tetanus three weeks after operation, and is given a special position, simply owing to the presence of this condition as a complication in the case. The post-mortem examination, as already mentioned, developed other conditions which would

have caused death, and which were, no doubt, the cause of the tetanic convulsions. 12 of the remaining cases died inside of twenty-four hours, either from severe primary or recurring hemorrhage, and the effects of the very extensive character of the wounds. 2 out of this 12 were cases requiring removal of the pregnant uterus, accompanied with many perforations of the bowel. Death in both occurred from secondary hemorrhage from uterine stumps, the ligature having slipped. 3 more had slight lacerations of the spleen and numerous perforations of the intestine. The spleen was removed and several inches of the tube excised in each case. In 3 others, from twelve to twenty inches of the bowel were excised, and many arterial trunks severed. 1 of the 12 had rapid mortification of five or six inches of the entire calibre of the bowel, apparently dependent upon the division of two large mesenteric arteries by the bullet, and also the resection of six inches of the intestine. The remaining 3 of the number dying inside of twenty-four hours are classified as having died of shock. In all of them the damage done by the missile was of excessive severity. The bullet was of large size (38 or 44 calibre), and the firearms possessing great penetrating and lacerating power. There was not manifested in any case any recognizable evidence of shock aside from that following great loss of blood. The transit of the bullet made no noticeable impression upon the pulse or respiration. In every instance in which signs of severe prostration became manifest, through change in respiration or weakening of pulse, there was found profuse hemorrhage to account for such condition. I am inclined to infer that the cases are exceptional, indeed, in which purely nervous shock will give rise to symptoms severe enough to mislead one to perform an unnecessary ventral section; rather, when severe constitutional manifestations follow the passage of a bullet through the abdominal cavity, good cause for them will be found, as soon as the cavity is opened, in wounded viscera or bloodvessels, and this course will often be the only possible way of either actually saving life or even prolonging it. None of these 12 cases could possibly have lived longer than twenty-four hours after the injury received. Most of them would have died much sooner without the control of hemorrhage alone made possible by the opening.

Two cases of the series were subjected to the expectant treatment. These cases were chosen because their injuries did not seem very severe; the hemorrhage was not great and the prostration not extreme. Both died: the first in one day; the other lived five days. Post-mortem examination showed extensive extravasation of the contents of the bowel and septic peritonitis. In one case an attempt was made to establish an artificial anus. The wounded intestine was resected and the ends fastened to the edges of the abdominal incision. The animal died of septic peritonitis in three days. This trial was made early in the experimentation, before any definite plan of procedure had been settled upon. This is the only experiment that has given rise to any regret, for I feel satisfied that with a fair junction of the bowel and a clean abdomen, the animal would have been saved. 18 of the 37 have thus far been accounted for; of the remaining 19, 10 died, and 9 recovered.

The 10 fatal cases lived from three days to three weeks. Peritonitis, from one cause or another, seemed to be the precursor of death. In 6 of them, mortification of the ligated stumps of the divided mesentery, together with mortification of the edges of the recently united bowel, was present. In the one that lived three weeks, death was the result of intestinal obstruction caused by the adhesion of a fold of the intestine to the stump of mesentery left free in the cavity. An acute flexure was produced at the point, against which the contents of the bowel had accumulated in large quantity. A rupture was found above this mass, through which extravasation had taken place. The inflammation was so intense that everything was matted together, and the specimen so horribly offensive it could not be preserved. There was no separation at the point of operation on the bowel; it was thicker here than elsewhere, but full distention with water was allowed without leaking. All of these cases demonstrate conclusively the necessity of great care in the manner of dealing with the divided mesentery, and in the application of the sutures which bring the separated bowel ends together. The remaining four furnished evidence of separation of the recently united parts of the intestine at the mesenteric junction. In all of them the thread failed to include the muscular and fibrous coat of the bowel, holding only the peritoneum; the result was extravasation, and death followed.

It may be a matter of surprise to you that the percentage of successful cases presented is so small—9 out of 19—so few out of so many. To me, knowing well the extremely adverse circumstances under which these experiments were performed, it is a matter of astonishment to have so many recoveries included in so few cases. It is suggestive to remember that all the recoveries followed the use of the modified Lembert's method of bringing the peritoneal surfaces together, while in many of the failures trials were made of other methods. Full six weeks have gone since the last case, followed by recovery, was subjected to operation. The first favorable case was treated four months ago. None of the animals present any evidence of being other than in their usual good health. The longest resection of intestine among the recoveries, measured over six inches, and included four perforations.

It is scarcely possible to do work of any kind under more disadvantageous surroundings than accompanied the performance of these experiments. The operative work was carried on, and the animals kept, in the prosector's room of a medical college during the winter session, in the midst of the odds and ends and bad hygienic conditions of such a place. No better accommodations could be secured, The labor has been purely one of experimental inquiry and not a striving after recoveries implying a choice selection of attending circumstances and special preparations to that end. Therefore I judge it proper and fair to claim the results as satisfactory. These results certainly indicate that a better showing is likely to follow where more satisfactory control can be had, over both patients and surroundings, than was present during these examinations. They clearly demonstrate that a hopeful expectation of recovery may be entertained after operation, and suggest the nature of the injuries produced, what accidents to avoid, and what treatment to adopt.

My confidence in coming before you with no better record is assured, when I remember that all of you are well aware of the great mortality of these injuries, under

all circumstances. It must be large surely, when Dr. Otis, in the *Surgical History of the War*, says that the authenticated cases of recovery can be counted on the fingers of one hand. It cannot be said that operative interference in these cases has as yet an established position. Still, perhaps, Dr. J. Marion Sims looked with prophetic eyes upon the future, when he closed the article already referred to with the following words:

"I have the deepest conviction that there is no more danger of a man's dying of a gunshot or other wound of the peritoneal cavity, properly treated, than there is of a woman's dying of an ovariotomy, properly performed. Ovarian tumors were invariably fatal, till McDowell demonstrated the manner of cure, which has now reached such perfection that we cure from ninety to ninety-seven per cent. of all cases. And by the application of the same rules that guide us in ovariotomy, to the treatment of shot wounds penetrating the abdominal cavity, there is every certainty of attaining the same success in these, that we now boast of in ovariotomy." (*British Medical Journal*, March 4, 1882.)

In a rather quaintly written but richly laden book on surgery by Herr L. Heister, Prof., etc., written in 1739, there occurs this passage:

"When the intestines are wounded but not let out of the abdomen, and therefore their wounds are out of reach, the surgeon can do nothing but keep a tent in the external wound, according to the rules laid down at Chapter V., and after this, bleed the patient if his strength will admit of it, advising him to rest, eat abstemiously, and to lie upon his belly; the rest is to be left to Divine Providence and the strength of his constitution. But the question may be asked here whether a surgeon may not very prudently, in this case, enlarge the wound of the abdomen, that he may be able to discover the injured intestine, and treat in a proper manner. Truly I can see no objection to this practice, especially if we consider that upon the neglect of it certain death will follow, and that we are encouraged to make trial of it by the successes of others. Sacherus, in Programmata Publico, Lipsiae, ed. 1720, mentions a surgeon who performed this operation successfully."

A period of one hundred years and more has rolled away since Dr. Heister published his belief and reported recovery, to the time when Dr. Sims expresses his convictions—over a century of doubts, timidity, uncertainty and gloomy misgivings, lightened only occasionally by some bold and resolute assertions. The future asks for action, and it is not unreasonable to assert that careful trials will accomplish successful results.

Avoiding any spirit of dictation, it seems proper to tabulate the following conclusions as an outgrowth of the experiments:

1. Hemorrhage following shot wounds of the abdomen and the intestines, is very often so severe that it cannot be safely controlled without abdominal section; it is *always* sufficient in amount to endanger life by secondary septic decomposition, which cannot be avoided in any other way than by the same treatment.

2. Extravasations of the contents of the bowel after shot injuries thereof are as certain as the existence of the wound.

3. No reliable inference as to the course of a bullet can be made from the position of the wounds of entrance and exit.

4. The wounds of entrance and exit of the bullet *should not be disturbed* in any manner except to control bleeding or remove foreign bodies when present. They need only to be covered by the general antiseptic dressing applied to the abdomen.

5. Several perforations of the intestine close together require a single resection, including all the openings. Wounds destroying the mesenteric surface of the bowel always require resection.

6. The best means of uniting the wounded intestine after resection is by the use of fine silk thread, after Lembert's method. It must include at least one-third of an inch of bowel tissue, passing through only the peritoneal and muscular coats, never including the mucous coat. The everted mucous membrane must be carefully inverted, and needs no other treatment.

7. Wounds of the stomach, small perforations, and abrasions of the intestine, can be safely trusted to the continued catgut suture.

8. Every bleeding point must be ligated or cauterized, and especial care devoted to securing an absolutely clean cavity.

9. The best method of treating the stumps of divided mesentery is to secure them to the intestine at the site of the resection; or, better, to leave the mesenteric surface of the bowel as indicated above. Still this requires further study.

10. *Primary abdominal section* in the midline gives the best command over the damage done, and furnishes the most feasible opening through which the proper surgical treatment of such damage can be instituted. Further, its adoption adds but little, if anything, to the peril of the injury.

11. Is not the moral effect of the assurance to the patient, that he will be placed in a condition most likely to lead to his recovery, a good substitute for the mental depression accompanying the general and popular conviction that his wounds mean certain death?

MEDICAL PROGRESS.

VESICATING LIQUIDS.—At the meeting of the Société de Médecine Pratique, on February 21st, M. DELTHIL presented a vesicating liquid composed of a solution of cantharides in acetic acid, which offers several advantages over the ordinary plaster masses. It is applied in coats by means of a brush. The first coat produces a rubefacient effect, the second a slight vesication, the third ordinary vesication, and the fourth very great vesication.

The advantages of this liquid are numerous: 1. Its action is limited and fixed; 2. Its liquid state enables one to apply it to all parts of the body where its employment may be necessary; 3. It is more acceptable to patients, and its action is perhaps less painful than that of ordinary vesicants; 4. It acts more quickly than plasters; 5. The various effects may be obtained by adding to the number of coats; 6. Its advantages are especially seen when used on children.

The action of the liquid may be limited to the desired space by cutting an opening in a piece of cere cloth, as in the application of Vienna paste. Before applying it the surface of the skin should be washed in warm water, and then rubbed dry and red; after applying the desired number of coats, the spot is covered with wadding.—*Journal de Méd. de Paris*, April 5, 1884.

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SCHOOL HYGIENE.

THE question of school hygiene, in which the people are universally and deeply interested, has of late attracted unusual attention, and its discussion is yielding important results. Careful and searching inquiries into the sanitary surroundings of school life, which are being conducted in many localities, reveal a condition of affairs too frequently at variance with the laws of hygiene and sanitary science. These investigations all tend to show that the regulation of school architecture, appointments, and management in accordance with the requirements of sanitary laws, is one of the pressing necessities of the day. Progress is being made in many directions, but it is insignificant when considered in relation to the vastness of the field yet to be improved. Prejudice, associated with a doubt of the need of the proposed innovations, and the cost which they entail, and ignorance of the real necessities of the case, are some of the obstacles to the readjustment of school construction and school administration in conformity with the established principles of hygiene. The remedy is diffusion of knowledge by persistent appeals to the public through the press and other agencies, the free exposure of existing faults, and the reconstruction of school boards and health boards in harmony with enlightened sanitary knowledge.

These remarks have been suggested by the results of a recent inquiry into the sanitary condition of the school-houses of Lynn, Massachusetts, which has revealed numerous defects, prominent among which are those in relation to the important particulars of lighting and ventilation. Massachusetts was among the first, if not the first State, to organize a State Board of Health, which from the beginning has made signal endeavors to improve the sanitary condition of the public schools. Other agencies have been at work, with this same laudable object in view. If in a State in which great attention has been given to the subject, notable examples of neglect of the fundamental principles of school hygiene are found to exist, as exemplified by the city of Lynn, it is fair to presume that elsewhere careful investigation is all that is needed to reveal equally bad, if not worse, examples of neglect.

New York and Brooklyn are now agitating this subject, in view of the unfavorable results of a recent sanitary inspection; and Philadelphia is disquieted because of the unsatisfactory sanitary condition of some of the public schools, which has been brought to light by a partial inspection by the Board of Health.

In Lynn a very prominent fault was insufficiency and objectionable arrangement of light. The construction of the buildings and the arrangement of the desks plainly indicated a want of information in regard to the ratio of window surface to floor space, and the proper arrangement of light required in school-rooms.

Especial attention was also given to the subject of ventilation. The amount of carbonic acid present in the air being taken as a measure of its impurity, it was found that in most of the rooms the air was *very bad*. Careful analyses showed the presence of from 12 to 29 parts of carbonic acid per 10,000 volumes of air, which is a rather startling exhibit when we reflect that 6 parts per 10,000 is the limit beyond which the air is unfit to breathe. In most of the rooms there were less than 200 cubic feet of air per scholar; in some the proportionate amount was only a little over 100 feet. This allotment would require a very frequent change of air every hour to supply the necessary amount of oxygen to each pupil, which it would not be possible to make without creating objectionable draught. The means of ventilation were found to be very inadequate. Under the above conditions of impurity, the air has a devitalizing influence; it enervates the system, impedes healthy development, and lessens the power of resistance against disease, and favors the chances of infection should disease-germs be present in the air.

The experience gained by the inquiry at Lynn is another argument in favor of regular, systematic inspection of schools by competent medical officers. The evils must first be detected before the remedy can be applied, and in no way can this be accomplished with greater certainty and better effect than by entrusting the hygienic supervision of schools to medical officers trained to the work.

DISCUSSION ON TUBERCULOSIS AT THE AMERICAN MEDICAL ASSOCIATION.

THE discussion on "Tuberculosis" at the late meeting of the American Medical Association failed to elicit any results of importance. It revealed, in the first place, that none of those who took part in it had been engaged in practically investigating the subject, except the author of the paper—Dr. Formad, Dr. Ernst, of Boston, and, perhaps, Dr. Welch, of New York; and of these, apparently, Dr. Formad alone had made extensive inoculations with cultures of the bacillus and with indifferent substances.

Dr. Formad's paper was imperfect in that it failed to present in a systematic way the results of his experiments, it having been deemed expedient for some reason that the publication of these should be, for the present, deferred. This, of course, weakened the position he took against the bacillus theory and against the view that tuberculosis is contagious or or even infectious. On the other hand, the replies of those who were arrayed against him consisted mainly in a criticism of his methods, against which some very unfounded aspersions were made, and of his results, in the discussion of methods of staining bacilli, and in the narration of a few facts bearing upon the contagiousness of tuberculosis.

Notwithstanding the fact that the almost unanimous voice of the Section was against Dr. Formad, the only *facts* adduced which actually tended to aid in the solution of the question were those drawn from his own experience by Dr. Traill Green, of Pennsylvania. This veteran member of the Association, characterized at once by his mature years, his ripe experience, and clear head, recalled his experience, of which he had had much, with those engaged in the making of grindstones, many of whom, entering the works with all the vigor and strength of youth, succumbed in a couple of years, despite all precautions, to tuberculosis due to the inhalation of the flinty particles thrown off in grinding the stones. On those dying thus he had made numerous autopsies, and found cavities of large size, together with the other well-known signs of tubercular phthisis. Here, certainly, he said, we have the operation of a cause distinct from the bacillus tuberculosis.

It became evident, too, from the discussion, how very few actual experimenters we still have among us, qualified by their own experience to sit in judgment on those important questions of pathology of which tuberculosis is one.

CREMATION.

THE adverse action taken by the British Parliament last week upon the bill for legalizing cremation, was more than counterbalanced by the practical endorsement of the system in the case of the illustrious Gross, whose remains were cremated at Washington, Pa., in fulfilment of the expressed wish of the deceased. This celebrated example of consistent advocacy of an innovation founded upon strictly scientific and sanitary principles will exert a world-wide and potent influence in favor of the practice, which has much to recommend it, and which is especially applicable to the great centres of population. That there should exist a deeply rooted prejudice in favor of inhumation is natural enough, since the custom has been universally adopted by Christian nations for many centuries. It is not to be expected that such a prejudice, founded upon a universal sentiment, and fostered by the influence of long-continued habit, will yield lightly to arguments based upon expediency and the teachings of sanitary science.

The difference between inhumation and cremation is merely that of mode, the ultimate results being the same. The disintegration of the body in either case is produced by oxidation. In the one case by the slow and corrupt process of putrefaction; in the other by the rapid and purifying action of intense heat, the constituents of the body being converted quickly and harmlessly into gaseous vapors and ashes by the oxidizing agency of fire. From a sanitary standpoint, the advantages of the latter method of disposal of human remains are incomparably superior to those fancied to be associated with the common practice of interment. The sudden transformation to a mass of unrecognizable ashes of the forms of those we have loved and reverenced in life, and love to think of as slumbering undisturbed beneath the sod, does violence to our feelings and shocks our tender sensibilities. But did we reflect upon the ghastly picture of what actually happens when the body is consigned to the earth, there would be less reason to decry a practice which is scientific, rapid, and complete in its execution, and which is devoid of danger to the living.

Cremation is beginning to be recognized as a necessity in very populous places. It rests upon the broad basis of verified sanitary principles, and must eventually succeed in its application among civilized people. The example which we have chronicled is notable because of the personage and of its exceptional character. It is a grand illustration of the influence of a conscientious conviction, derived from an unbiassed study of the question, upon a mind of extraordinary grasp and foresight, and possessed of courage which was not deterred from acting upon such a conviction in the face of widespread prejudice. This closing scene in the drama of a great and eventful life is characteristic of the man, and will not be without its lesson of instruction.

LABOR AND PUERPERALITY IN OLD PRIMIPARÆ.

How far childbirth and lying-in are unfavorably affected by the primipara being old when she first is

a mother, is a question to which considerable professional attention has been given, though probably not as much as it needs. We, therefore, turn with interest to a recent paper by DR. F. STEINMANN, of St. Petersburg, in the *Archiv für Gynäkologie*, 1884, Heft 3, in which he observes that the estimate of the time when a primipara is called old varies between twenty-five years (Fasbender) and thirty-five years (Mangiagalli), but he accepts that which most authorities have adopted—to wit, thirty years. By the way, it of course follows that when a woman marries at twenty-nine years she is an old bride, a truth which one would hardly dare to utter in polite society. Dr. Steinmann's cases are taken from twelve years' statistics of the Petersburg Maternity, during which time there were 28,279 deliveries, and of the women delivered, 645 were old primiparæ. Of the 645, a fraction over 69 per cent. were 30–34; 26.2 per cent. 35–39, and 4.2 per cent. 40 years and over: one of these was fifty-two years old.

A very instructive table of the general mortality of lying-in women and of old primiparæ is given, presenting some very marked contrasts. Thus, in 1875, when the general mortality was three a half per cent., that of old primiparæ was nearly fourteen per cent.; and, again, in 1881, when that of the former was only a half per cent., that of the latter was eight per cent. Certainly, the facts adduced by Dr. Steinmann, which also show a decidedly greater fœtal mortality occurring when primiparity is late, are a strong objection to late marriages.

CORROSIVE SUBLIMATE IN OBSTETRIC PRACTICE.

BY general consent, corrosive sublimate has been accepted as the most useful antiseptic, or germicide, in obstetric practice, and its safety has not been disputed. Recently, however, STADTFELD, of Copenhagen, has published in the *Centralblatt für Gynäkologie* a case in which death, believed to be due to mercurial poisoning, followed an intrauterine injection of corrosive sublimate, the strength of the solution being 1 to 1500. This is altogether an exceptional result, and, beside, the strength of the solution was greater than that commonly used for such injection.

Stadtfeld further objects to the corrosive sublimate because weak solutions, having neither taste nor color to indicate the character of the fluid, may cause serious mistakes; but, to prevent such mistakes, it has been proposed to color the liquid with a small quantity of methyl blue or fuchsine. Really, however, mistakes are almost infinitely improbable, for usually the bottle containing the corrosive sublimate solution is very much larger than a bottle having medicine for internal administration, and besides is plainly marked by the word *Poison*. If we are to reject all colorless and tasteless solutions of medicine which are dangerous in improper doses or uses, our therapeutics will become greatly restricted in some directions.

THE PROGRAMME AT THE LATE SESSION OF THE AMERICAN MEDICAL ASSOCIATION.

WE have already said that, on the whole, the recent meeting of the American Medical Association may be regarded as successful. At the same time there were some defects, the calling of attention to which at this date may serve to prevent a repetition next year. The chief of these was that the programme was over-full. It is creditable, of course, to a chairman of a Section to have secured a full programme, but he should, at the same time, see that those whom he invited to prepare papers, some of whom may have come a great distance for this purpose, shall have the opportunity of so doing. Experience has shown over and over again that very few papers offered at the Association can be disposed of in twenty minutes. At the late meeting, several occupied an hour, and some took even more time, including the discussions. This being the case, it is evidently impossible to dispose of nine papers, in a period of three and a half hours. It is evident, too, that one-half that number would have been fully enough for an afternoon's work, especially if one is on a subject calculated to invite discussion, as is always desirable.

Again, all remarks in discussion should be limited to ten minutes. Such remarks are not intended to be disquisitions, and if limited to points brought out in the original paper can easily be included in that time, often, indeed, in less, and where more time is taken, they oftentimes resolve themselves into mere repetitions. It is also objectionable to permit the reading, under the head of discussion, of written essays of considerable length, having in some instances no relation to the points brought out in the original paper, as was done at the late session.

Finally, no paper should be permitted to come up out of its place, or at a fixed time, to the exclusion or precedence of papers on the programme before it. Such a course is obviously unjust to those who happen to precede and who are excluded thereby from reading papers. The programme should be literally followed out in the order printed.

We venture to suggest that, if the above points are remembered at another meeting, it will prove, as far as scientific work is concerned, even more successful than the one just terminated; and there will be, certainly, less dissatisfaction on the part of those whose papers are of necessity left unread, and whose participation in the work gives character to the proceedings.

SOCIETY PROCEEDINGS.

THE AMERICAN MEDICAL ASSOCIATION.

Thirty-fifth Annual Meeting, held at Washington, May 6, 7, 8, and 9, 1884.

(Specially reported for THE MEDICAL NEWS.)

FRIDAY, MAY 9TH—FOURTH DAY.

GENERAL SESSION.

THE Association was called to order at 9.30 A.M.

DR. J. C. DALTON, of New York, offered the following resolutions on behalf of the Committee on

EXPERIMENTAL MEDICINE:

Resolved, That the Committee on Experimental Medicine be empowered and instructed to add to its number and efficiency by the election of associate members from different States, and that it report to this Association at its annual meeting, any matters relating to the subject of experimental medicine which may need the consideration or action of the Association.

Resolved, That in view of the attempts that have been or may be obstructed by restrictive legislation, in the progress of experimental medicine, this Association desires to express its earnest conviction that experimentation on animals is a most useful source of knowledge in medical science; that it is the means by which many valuable discoveries, both practical and scientific, have been accomplished; that its direction and supervision can be properly entrusted only to members of the medical profession; and that its restriction or prohibition by law would inevitably retard the advancement of medical science and the improvement of the medical art. Unanimously adopted.

The Committee on the

NOMINATION OF TRUSTEES OF THE JOURNAL,

reported that the names offered by the Committee were the same as those chosen by the Committee on Nominations as reported yesterday. However, as they believed the action of the latter committee was unconstitutional, they begged that the error be not permitted to go on the records of the Association, but that the action of the Special Committee be approved. A delegate then moved that it be declared the sense of the Association that the Trustees be nominated by the Nominating Committee, in the same manner as other officers of the Association are nominated.

DR. N. S. DAVIS stated that, by reference to the minutes of the Association, it would be found that special action had been taken as to the appointment of these Trustees, in the report of a committee of which Dr. Packard was Chairman, and which was adopted at St. Paul, in 1882, it being therein provided that the Trustees be appointed by a special committeee of seven appointed by the President.

The original motion was then withdrawn and a substitute adopted, that hereafter the appointments be made by the regular Committee on Nominations.

DR. AUSTIN FLINT, as Chairman of the Committee to draft resolutions on

THE DEATH OF DR. GROSS,

reported that it had been impossible to get the Committee together, and asked that the Committee be continued, with power to report in print.

The report of the Committee to consider the

RECOMMENDATIONS CONTAINED IN THE PRESIDENT'S ADDRESS

being called for, DR. N. S. DAVIS stated that some of the gentlemen appointed had left the city, and that the remaining members of the Committee considered it not expedient at present to take any action on the Code of Ethics. They believed that any declaration of this nature should be made only after due deliberation. Dr. Davis then presented, on his own responsibility, the following preamble and resolution:

Whereas, Persistent misrepresentations have been and are being made in regard to the Code of Ethics of this Association, therefore,

Resolved, That the President appoint a committee of five, of which he shall be a member, to report at the next meeting of the Association such explanatory resolutions as the committee may deem proper. Adopted.

DR. GARCELON, of Maine, stated that the Nominating Committee had failed to appoint a member of the Committee on Necrology for the State of Maine. He therefore nominated Dr. Seth Gordon, of Portland, and moved his election. Carried.

DR. DEERING J. ROBERTS, of Tennessee, then delivered the

ADDRESS IN STATE MEDICINE.

He defined the object of the Section to be the application of medical science to the good of the State. Reference was made to the recent and more remote discoveries in medicine, among others to the germ-theory of the origin of diseases. The honor of this discovery he attributed to two Tennessee physicians—Drs. Campbell and Thomas—who, he announced, had discovered the germ of cholera thirty years ago.

The power of sanitary medicine to prevent the spread of disease was illustrated by the recent limitation of the spread of cholera in the East, and of yellow fever in the South. Some remarks were made upon the importance of medical education. He expressed himself as very decidedly opposed to legislation to regulate the practice of medicine, and referred to the notable discoveries, etc., which were made before any such regulation was attempted, also quoting the remarks of the distinguished Daniel Drake, that little or no good is done by laws of that character, and that he did not think the laws of New York and Ohio, which in his time stood alone in that respect, were of any advantage to those States. He also referred to the more moderate views of Prof. Huxley on the subject. He approved of the work of the National Board of Health, as well as of that done by the Marine-Hospital Service, and regretted that any contest should have arisen between them. He then favored certain legislation in regard to medical and sanitary purposes, among other things suggesting the propriety of the President of the United States establishing a Health Department, the chief of which should constitute another member of his Cabinet, with compensation and rank the same as those of the present Cabinet Officers, and whose duty it should be to inspect the working of sanitary measures and suggest to the President from time to time such improvements as might be demanded, and to appoint all necessary assistants and officers.

MISCELLANEOUS BUSINESS.

It was then announced that Dr. Smith Townshend, who was appointed to represent the District of Columbia in the Committee on Necrology, was ineligible to the office, because he had not been a delegate to this meeting of the Association. Upon motion, Dr. Thomas Antisell, of Washington, was appointed in his place.

DR. CHANCELLOR, of Virginia, stated that his name had been placed on the Committee on State Medicine, but that, as he would be unable to serve on the committee, he respectfully requested to be relieved of the appointment.

THE PRESIDENT then announced the following as

THE COMMITTEE ON THE INTERNATIONAL MEDICAL CONGRESS,

which it was proposed should be invited to meet in this country in 1887: Drs. Austin Flint, of New York; I. Minis Hays, of Philadelphia; L. A. Sayre, of New York; Christopher Johnston, of Baltimore; G. J. Engelmann, of St. Louis; J. S. Brown, U. S. N.; J. S. Billings, U. S. A. The Committee was vested with power to augment its numbers.

DR. JOHN H. PACKARD, of Philadelphia, asked that

THE AMENDMENT TO THE CONSTITUTION

which was proposed at the meeting of the Association at St. Paul, in 1882, should now be brought before the assembly for action. The amendment, as read from p. 577 of the volume of *Transactions* for 1881, was "Members by application shall consist of such members in good standing in County or State medical societies as shall make application in writing for such membership." Dr. Packard had offered a paragraph in addition, so that it should read, "Membership shall be acquired by any one received as a delegate; or upon the application of any member in good standing of a State or County society recognized by this Association, the application being accompanied by a certificate from the President and Secretary of his society, testifying to the good and regular standing of the applicant. Members by application shall remain such so long as they shall continue in good standing in their local society and in this Association, and pay regularly their annual dues." The mover of the amendment stated that he believed a measure of this nature would increase the financial income of the Association to an extent that would aid it very materially in carrying out its objects.

DR. J. M. TONER, of Washington, objected to taking action upon this amendment, since it should have come up at the meeting last year, and, having failed in that, it was not allowable, he said, to bring it up now.

DR. J. S. BILLINGS asked, in order to adjust matters, that the amendment be now presented for action at the next meeting.

DR. KINLOCH finally moved that, since it was evidently the spirit of the By-Laws. if not the letter, that amendments be before the Association long enough to be thoroughly understood, and not for any arbitrary period, the amendment offered should be adopted. The motion was carried.

In reply to a question whether members by application should be entitled to a vote in the proceedings of the Association, it was stated that, according to the Constitution, none but delegates had that right.

DR. C. H. VON KLEIN, of Ohio, announced his intention to offer an amendment providing that the Association shall, in the future, no longer receive delegates who are not graduates of medical colleges which require a thorough preliminary education of their students.

SECTIONS TO NOMINATE THEIR OWN OFFICERS.

DR. FOSTER PRATT, of Michigan, moved the following:

Resolved, That the By-Laws be so amended as to require that each Section shall, in the future, elect its own chairman and secretary, other nominations to be made as heretofore.

MISCELLANEOUS BUSINESS.

DR. KELLER, of Arkansas, asked that his resolution on cremation be referred to the Committee on State Medicine. Granted.

DR. ROBERTS, of Tennessee, offered a vote of thanks for the invitation to visit the Museum of Hygiene, and moved that Congress be petitioned to place the Museum on a substantial financial basis; also to provide for it a new home. Adopted.

REGISTRATION.

A resolution was adopted requiring that the Committee on Arrangements and the Permanent Secretary shall provide a method of registration by which delegates may send in their applications and receive cards of membership by mail previous to the date of meeting.

THE NOMINATING COMMITTEE INELIGIBLE TO OFFICE.

A motion was made that it is the sense of the American Medical Association that it is not expedient for the Nominating Committee to nominate any of its own members for election to the offices of the Association.

IMMIGRATION OF THE DEFECTIVE CLASSES.

The resolution offered by Dr. Pratt in the Section on State Medicine was offered and adopted.

A motion was then carried to defer the remainder of the business until after the delivery of the addresses set for the day.

A motion was also passed requiring that the papers remaining upon the programme should be read by title and referred to the Committee on Publication.

DR. J. J. CHISOLM, of Baltimore, who was to have delivered the

ADDRESS ON OPHTHALMOLOGY,

stated that he had intended delivering an address, not so much on the subject of the recent advancement of this department, as to call attention to the need of a more general diffusion of knowledge in this important branch. There are many facts, he said, that have been well established by the specialists which should be in the possession of the general practitioner, but which are generally overlooked by him.

DR. WILLIAM LEE stated that the subject of his

ADDRESS ON DISEASES OF CHILDREN

was "The Recent Advances in the Study of the Infectious Diseases in Children." He regretted very much not being permitted to read his paper, as he considered the subject an important one. The paper was referred for publication.

DR. T. W. BROPHY stated that he had prepared his

ADDRESS ON ORAL AND DENTAL SURGERY,

and had taken for his subject "The Importance of Establishing in Our Medical Colleges a Chair of Oral and Dental Surgery." He also regretted being deprived of the privilege of reading a paper on a subject which he considered so important. The paper was referred.

THE REPORT OF THE COMMITTEE ON NECROLOGY

being called for, DR. J. M. TONER, the Chairman, stated that the works of the Committee had been published regularly in the *Journal* of the Association, and that hence his report had virtually been submitted. He stated, also, that, if agreeable to the Association, the Committee would continue that method of making their report.

STATE CONTROL OF MEDICAL EDUCATION.

DR. FRANZONI offered a resolution that in view of the fact that there was a movement on foot in some of the States to secure a better preliminary education of medical men, as well as to raise the standard of medical education, and in view of the importance of having the same standard adopted, it should be resolved that the members of the American Medical Association in the different States, should endeavor to secure the passage by Congress, or the several State Leislatures, of bills requiring candidates for the degree of M.D. to pass an examination, in all the branches of the medical sciences, before a board appointed for the purpose.

DIVISION OF THE SECTION OF OPHTHALMOLOGY AND OTOLOGY.

DR. CARL SEILER, of Philadelphia, offered an amendment to the By-Laws, providing for the division of the Section on Ophthalmology into two sections, one to include ophthalmology and otology, the other, laryngology, rhinoscopy, etc.

THE REPORT OF THE TREASURER,

DR. R. J. DUNGLISON, showed a balance in the treasury of $2212.07. The report showed no difference in the sources of revenue, except that subscriptions to the *Journal* and payments for advertisements therein, had been added. The report stated that it was the custom of a large number of members apparently to comply with the By-Laws by paying dues for about two years in three, instead of paying annually, and the Treasurer asked that a resolution expressing the sense of the Association in this regard, should be presented.

DR. BRODIE moved the following:

Resolved, That it is the sense of this Association that the continual payment of annual dues shall be necessary to the continuance of membership.

LIBRARIAN'S REPORT.

The Librarian reported that two hundred and forty-nine volumes have been added to the library during the past year, making a total of two thousand and sixty-six distinct titles, or about six thousand volumes, including pamphlets.

THE MEDICAL AND SURGICAL HISTORY OF THE WAR.

DR. J. C. GREENE, of Buffalo, offered the following preamble and resolution:

Whereas, The first edition of the *Medical and Surgical History of the War of the Rebellion* has been long since exhausted, being so distributed by the members of Congress at the time the several volumes were published, as to leave but a small number of volumes for general distribution; and

Whereas, Nearly every physician and surgeon desires to obtain the volume; and

Whereas, The third volume of the *Medical History* has not yet been completed, which is necessary to complete the entire work, therefore,

Resolved, That it is the desire of the American Medical Association that the third volume should be issued at the earliest possible date; also, that Congress be respectfully requested to issue an entire edition of the work known as *The Medical and Surgical History of the War of Rebellion*, to be disposed of at cost, plus the ten per cent. required by law. Adopted.

PLEURO-PNEUMONIA AMONG CATTLE.

DR. BEACH, of Ohio, presented the following resolution, which was adopted:

Resolved, That the members of the American Medical Association consider it important that proper legislation be had before the adjournment of the present session of Congress, to provide for the extermination of the disease among cattle, known as pleuro-pneumonia.

INTRODUCTION OF THE PRESIDENT-ELECT.

DR. HENRY F. CAMPBELL, of Augusta, the President-elect entering the hall, was conducted to the platform.

DR. FLINT in introducing him said: "I have had somewhat the feeling of an usurper since the last meeting. I have felt that I occupied a position to which I had no claim. But that feeling is somewhat ameliorated to-day by the privilege I have of introducing to you my successor. I can freely express the assurance, in which you will all join me, that the duties of the office and the interests of the Association will be well cared for in his hands."

DR. CAMPBELL, in reply said: "I cannot let those remarks pass without a reply. Instead of a usurper, he has honored the place and made the chair—the throne—that I am to occupy more noble. I am highly gratified at being elected the President of the American Medical Association, and I will endeavor to sustain the honor of my office, the dignity of the profession, and the ethics of the Association."

MISCELLANEOUS BUSINESS.

DR. GARNETT moved a vote of thanks to the Postmaster of Washington City for establishing a branch office in the place of meeting, for the Association.

DR. BRODIE offered a resolution that the Board of Trustees be authorized to procure hereafter a stenographic report of the proceedings of each meeting, to be published with the minutes of the Association.

DR. VON KLEIN offered a resolution that the custom of opening the sessions of the Association with prayer be dispensed with. A motion to lay the resolution on the table was unanimously carried.

DR. VON KLEIN offered a resolution that, as a fitting mark of respect to the late lamented Dr. S. D. Gross, the next issue of the *Journal* of the Association be draped with mourning. The resolution was referred to the Special Committee, previously appointed.

DR. LEASURE offered the following, which was adopted:

Resolved, That the Association protest against its members signing certificates as to the action and remedial powers of various proprietary or trade-mark preparations, mineral waters, etc.

A communication was read from the West Philadelphia Medical Society, protesting against the attempts of certain mercenary persons to lay aside the principles of the Constitution of the Association, and the Code of Ethics. A motion to lay on the table being lost, it was referred to the Judicial Council.

A resolution was adopted asking Congress to enact laws which shall require the labelling of all such articles as caustic potash or soda, concentrated lye, etc., as poison, and the regulation of their sale, the same as all other deadly poisons.

COMMUNICATIONS.

A communication from the New Jersey State Medical Society was partially read and referred to the Committee on Publication.

A communication from the St. Louis Medical Society relative to the methods of advertising in use by medical colleges was referred to the Judicial Council.

THE CHAIR announced the appointment of the following

DELEGATES TO FOREIGN SOCIETIES:

To the Canada Medical Association, Drs. William Brodie, W. S. Tremaine, E. N. Brush, and H. O. Walker.

To the British Medical Association, Dr. William Brodie.

To the International Medical Congress, and any other European association that the delegates may choose to attend, Drs. J. W. S. Gouley, of New York; H. D. Didama, of New York; C. C. Wyckoff, of New York; F. Hyde, of New York; W. H. Daly, of Pennsylvania; L. Friederich, of District of Columbia; J. M. Browne, U. S. N.; D. W. Prentiss, of District of Columbia; N. C. Husted, of New York; S. C. Busey, of District of Columbia; T. J. Gallaher, of Pennsylvania; C. Deveny, of Illinois; W. W. Johnson, of District of Columbia; A. M. Pollock, of Pennsylvania; J. S. Billings, U. S. A.; C. E. Vaughn, of Massachusetts; H. O. Marcy, of Massachusetts; J. V. Shoemaker, of Pennsylvania; E. C. Harwood, of New York; H. P. C. Wilson, of Maryland; J. C. Hutchison, of New York; J. F. Gabriel, of Virginia; S. C. Gordon, of Maine; T. L. Estabrook, of Maine; G. T. Stevens, of New York; S. J. Jones, of Illinois; E. M. Dent and Joseph Parrish, of New Jersey; Edward Boeck, of Missouri; Christopher Johnston, of Maryland; J. N. Quimby, of New Jersey; and Austin Flint, Sr., of New York.

THE DEATH OF DR. J. MARION SIMS.

A resolution offered to express the regret of the Association for the death of Dr. J. Marion Sims, and the sense of their loss, was unanimously adopted.

A MONUMENT TO BENJAMIN RUSH.

DR. GIHON called attention to the fact that among all the monuments to the memory of great men for which Washington is noted, there is not one to the memory of a physician. He, therefore, moved that the Association signalize its meeting in this city by providing for the erection of a statue of the eminent Dr. Rush, who was a member of the Continental Congress, a signer of the Declaration of Independence, and intimately associated in various ways with the early history of this country. He further asked that a committee of seven be appointed to consider the advisability of the project. Adopted.

RESOLUTIONS OF THANKS.

DR. BRODIE moved a vote of thanks to the Committee of Arrangements, and other committees, and to the ladies and gentlemen who have given receptions and done so much in various ways to make pleasant the stay of the Association in Washington.

DR. GARCELON, of Maine, moved that the Association return its sincere and heartfelt thanks to the retiring president for the graceful and efficient manner in which he had conducted the proceedings of the session.

DR. FLINT, in response, thanked the Association for the forbearance and coöperation he had received in his attempts to perform the duties of a presiding officer. He also congratulated the Association on the fact that the present had been the largest meeting ever held; on the amount and quality of sectional work that was done, and on the interest and ableness of the discussions in the Sections. "I therefore wish," he said, "the members a safe return home, and a continuance of life and of every happiness."

The Association then adjourned to meet in New Orleans the last Tuesday of April, 1885.

SECTIONS.

SECTION ON PRACTICE OF MEDICINE.

WEDNESDAY, MAY 7TH—SECOND DAY.

DR. R. HARVEY REED, of Ohio, read a paper on

IRRITATION OF THE CAPSULE OF GLISSON.

This is a periodical affection located in the liver or capsule, affecting the tunic of the liver and penetrating to the lobules of the organ, and often partakes of a rheumatic character. It is characterized by darting pains of a burning or boring character, coming on usually at night. It is not ushered in by a chill, nor is it accompanied by febrile disturbance, loss of appetite, headache, or constipation. It occurs sufficiently often to merit special attention, as Dr. Craig, of Ohio, says he has seen five cases in a year, and the author has observed it twenty-five times in six years. The affection generally attacks those who follow sedentary occupations, and is more frequently observed in women. It is a disease of middle life, is more frequent in those not addicted to alcoholic stimulants, and is often associated with rheumatism. Its onset is often insidious, the patient feeling, at times, slight pain in the hepatic region, to which he pays but little attention. With each return, however, the attacks become more severe and the intervals shorter. The history of a paroxysm would be somewhat as follows: The patient goes to bed well, is awakened by severe pain of the character above described, which in the less advanced stages of the disease will subside by morning, leaving the patient as well as usual. With each return the severity as well as the duration of the attack increases, and it sometimes lasts for several days. The pain is confined to the hepatic region, and is burning, boring, and lancinating in character. The tongue may be somewhat furred,

and there is sometimes vomiting, but there is no increase in the temperature, nor is there headache or jaundice. There is slight tenderness on pressure over the liver, it is not perceptibly harder, there is no change in the size of the organ, and no sign of hob-nail liver. The stools contain no gall-stones, and the urine is normal. In the later stages of the disease there may be a certain amount of emaciation. This disease must be differentiated from hepatic colic, interstitial hepatitis, congestion of the liver, perihepatitis, cirrhosis, and hepatalgia. Hepatic colic is excluded by the gradual onset and increase of the disease, by the occurrence of the attacks at night, whilst in hepatic colic they may occur at any time, especially after meals or exercise. The vomiting which so frequently accompanies the colic is generally absent. The absence of jaundice and failure to discover gall-stones in the stools complete the differential diagnosis. *Interstitial hepatitis* is differentiated from irritation of the capsule by its connection with alcoholic excesses; by the appearance of venous stigmata on the cheeks, etc.; by the presence of jaundice; the pain over the liver is constant instead of intermittent; there are nausea and vomiting on rising, and the loathing of solid food; diarrhœa alternates with constipation, and the urine is scanty; there is occasional pyrexia, and there is obstruction to the portal circulation, and enlargement of the liver, followed by contraction; there is often ascites, and a dry, harsh skin. Besides this, interstitial hepatitis is often the result of syphilis, while irritability of the capsule seldom is. In *congestion of the liver* there are enlargement, a continued sense of tightness in the hepatic region, jaundice, nausea, anorexia, furred tongue, headache, disturbances of digestion, vomiting, diarrhœa, dyspnœa, drowsiness, signs of portal obstruction, urine scanty and high-colored, temporary albuminuria. The attack continues without interruption. In *perihepatitis* there is peritonitis, and the inflammation may extend to the capsule of Glisson. It may arise from traumatic causes. It is ushered in with a chill, followed by fever, and there is much superficial tenderness.

Inflammation of the bile ducts occurs mostly in children and old persons. There is obstruction to the entrance of bile into the duodenum—jaundice; it is preceded by gastro-intestinal catarrh, the pulse is slow, and there is no bile in the stools; while in irritation of the capsule, the stools are normal. *Cirrhosis of the liver* can be readily differentiated by its history and signs. *Hepatalgia* is extremely rare, and occurs only in nervous women, being a purely functional disease. Irritation of the capsule may continue for years, and, if left to itself, has no inherent tendency towards recovery, but the prognosis as regards life is good. There are few diseases which yield more quickly to well-directed treatment. The author relies mostly on alkalies and bitter tonics—his favorite combination being bicarbonate of soda with pulv. hydrastis canadensis. Sodæ et potass. tart. and infusion of gentian are often serviceable. Mercurials are seldom useful. It should be remembered that it may be complicated by rheumatism, malaria, and disease of the liver, which must, of course, affect the treatment. Stimulants and condiments are to be avoided, regular habits enjoined, and active exercise according to the patient's strength advised. Baths containing chloride of sodium, conjoined with rubbing, are beneficial. During the attack, morphia may be used hypodermatically, and local application of heat affords relief. Anodyne treatment should be suspended as soon as possible.

DR. WILLIAM PEPPER, of Philadelphia, then read

A CONTRIBUTION TO THE CLINICAL STUDY OF EPILEPSY.

He said that our conception of epilepsy is necessarily broad and somewhat vague. It would be well to exclude, if it were possible, from the category of the affections grouped under this name, all cases in which there are definite anatomical lesions, but while this can be done in certain cases, *e. g.*, where there is a cerebral tumor, it is often impossible, and probably a large number of cases of so-called epilepsy are really associated with some anatomical lesion. He referred to a case of a physician who was forty-four years old when he died. When he was twenty-three years old he had received a severe injury to his head, which was followed by convulsions. He recovered and engaged in active practice. After eighteen years he had a convulsion following a period of over-work. After this, convulsions returned every four to six weeks without any cerebral symptoms. Bromides failed to produce any effect, but temporary recovery followed the use of the actual cautery and rest. A relapse occurred on returning to work; trephining was resorted to, and a depression of the internal table of the skull was found and raised; a spicule of bone was found pressing on the brain, in which were two small abscesses. These were certainly caused by the injury eighteen years before. Besides the difficulty of excluding anatomical lesions, it is sometimes hard to exclude hysteria, and the two conditions are sometimes combined.

One of the fundamental elements in the production of epilepsy is morbid instability of nerve tissue. Heredity has a marked effect, and so has nervous exhaustion from rapid growth or after severe diseases, as typhoid fever and scarlatina. A very frequent cause is shock, whether psychical, or from mechanical injuries, or, and this very frequently, sunstroke. Instability of the circulation through the brain is an important factor, as are also anæmia and cardiac disease; so also, prolonged peripheral irritation, as in protracted teething, undue sexual excitement, and intestinal irritations. Epilepsy is then not a distinct disease, but results from morbid instability and irritability in the gray matter of the encephalon. There are cases which are marked by progressive molecular changes, and more or less regular manifestations, but this is uncommon. The evil effect of habit is often seen in this disease, and unless the tendency is avoided, the attacks become more frequent. Sometimes the slightest cause is sufficient to bring on an attack, such as a noise or an indiscretion in diet—this last is a frequent cause, by impairing nutrition and lessening the stability of the nerve tissue, either by reflex action or by the blood being poisoned by the products of malassimilation.

It is not infrequently associated with lithæmia. It often follows scarlatina, either from exhaustion from the disease, of widespread tissue changes, or by inducing renal changes, which, while not sufficient to show the existence of albumen, are sufficient to cause a certain amount of toxæmia. Dr. Pepper called attention to the frequency of the prodromic signs which occur in epi-

lepsy, such as loss of appetite, pains in various parts of the body, changes in the appearance of the face, foul breath, digestive disturbances, and dwelt upon the effect of excitement in the production of the attacks, whether the excitement be from sexual intercourse or alcohol, from intellectual over-work (especially noted when there was competition, as in examinations), or from anxiety. Over-work or severe strain, especially when connected with cardiac disease, excessive heat, brilliant sunshine, bad air, all conduce to bring on an attack in those who are subject to epilepsy. It rarely happens that epileptics are in really good health.

In regard to the treatment, Prof. Pepper thought that while the bromides were of incalculable benefit, they had been used too much as matters of routine treatment, and had led to the overlooking of the still more important subjects of attention to dietetics and hygiene, and the administration of medicines on general principles. The bromides control, but do not cure epilepsy. The peculiarity of each case must be studied, and a suitable regimen must be inaugurated, and the primary, underlying, or provoking causes must be searched out and treated on general principles. Thus, lithæmia and anæmia must be met with appropriate medication, and very often it will be found that prolonged rest is most serviceable. This is especially the case where there is cardiac involvement. In these last cases, also, digitalis is often found useful. So also gastro-intestinal irritation must be treated when present. In these cases, silver nitrate, zinc, or arsenic is valuable. Where there is any local irritation it must be removed. Counter-irritation, as by actual cautery to the spine, is most useful, especially where there seems to be cranial involvement. It is specially useful in cases caused by sunstroke. Trephining should be done oftener than it is. The influence of adherent prepuce has been somewhat overestimated. Pure milk diet is often useful.

During the attack nitrite of amyl is most helpful, and is important for the breaking up of the habit. Returning to the bromides, he thought they often injured by irritating the stomach. He used them in the smallest dose that would have the desired effect. He had often seen enemas of chloral hydrate act admirably. This mode of administration is specially indicated in cases in which there is irritability of the stomach.

PROF. AUSTIN FLINT, of New York, in opening the discussion, presented

AN ARGUMENT FOR THE TOXICAL PATHOLOGY OF EPILEPSY.

He did not consider this out of place in this discussion; the treatment must, in the end, depend upon pathology. There is at present an absence of any distinct pathological doctrine on epilepsy. It has no established anatomical character. It is essentially a neurosis, without known causative conditions. There are no distinct prodromata to the attacks; the aura is mostly wanting, and has no special significance. The various theories maintained by Hughlings Jackson and others do not really furnish explanations of the disease. The field, then, is comparatively clear of old theories to be taken out of the way. There is a close analogy between epilepsy and states of the system produced by toxical agents, as uræmic convulsions. It is now generally accepted that these convulsions are caused by retained substances in the blood that should have been excreted by the kidney. But he remembered the time when the pathology of uræmic convulsions was as much a mystery as that of epilepsy is now. Sometimes uræmic coma, etc., simulate epilepsy so completely as to require an analysis of the urine to make a differential diagnosis; and again, when the epileptic attack is of long duration it may simulate the uræmic condition. This would seem to show that the pathology of epilepsy is toxical. The clinical history, the absence of ailments prior to the attack, the short duration and quick recovery, seem to point to the effect of a transient poison in the production of the seizures. This does not exclude, however, the effect of local conditions. Pathology has not yet given successful direction to the therapeutics of epilepsy. The more recent remedies introduced seem not to be curative, but to enable the nervous centres to tolerate the presence of the poison.

The *modus operandi* of the poison, as well as its nature and source, remains to be discovered. Then, when these are found out, we shall be able, with more hope of success, to discuss how to prevent the formation of the poison, neutralize its effects, and eliminate it from the system.

DR. EUGENE GRISSOM, of North Carolina, had seen a large number of cases of epilepsy, but they have generally been at an advanced stage of the disease. He considered it as often an organic affection, and it is usually inherited. It is generally preceded by eclamptic attacks during childhood, and shows itself about the age of puberty. It may represent chorea, or some wasting disease in the parent. It may occur in the offspring of syphilitic or scrofulous parents. It may be the last development in a long course of family degeneration, as in the royal house of Spain. No course of treatment can in one lifetime restore the injuries of generations. It is caused by innutrition of the nerve centres as opposed to malnutrition. The circulation itself is disordered, and the stimuli given to restore the organism to its normal condition may be transformed into excitants. When the disease is functional it is more hopeful. It is the more frequent form, and is protean in its manifestations. It is induced (1) by draughts on the vital powers of any kind; (2) irritation of the peripheral trunks. It is apt to expend its power chiefly on the most used muscles of voluntary motion. It is often associated with anæmia. The treatment calls for regular, systematic, but unfatiguing, exercise; for influences that will build up and develop the *whole man*. Special complications demand treatment adapted to these conditions. He recommended preparations of zinc when there seemed to be pneumogastric irritation.

DR. JAMES F. HIBBERD, of Indiana, doubted the advisability of always administering drugs. Excluding cases in which one can recognize the existence of an exciting cause, he did not believe that epilepsy could be cured. Medicine, at most, will only arrest its manifestations for a time. Every individual has his own standard of health. When that is reached, all remedies should be stopped. He believes there is such a thing as a convulsive diathesis. Individuals who suffer from it will have epileptic seizures from causes that might produce only headache in an ordinary person.

DR. J. J. CALDWELL, of Maryland, doubted whether cases lasting for years could be of toxæmic origin.

DR. JAMES TYSON, of Philadelphia, recommended the use of a seton through the nape of the neck. He had known one case in which it was tried fifteen years ago, and there has been no relapse since.

DR. E. M. BARTLETT, of New York, also recommended setons, and united in Dr. Pepper's warning against the indiscriminate use of bromides.

DR. BALTEEN, of Massachusetts, had great faith in the use of bromides, but would vary the salt in different cases, using potassium bromide in plethoric cases, sodium and iron bromides in anæmic, and lithia bromides in gouty cases. He had seen good effects from physical influences, such as causing patients to use the spirometer, the peculiar noise seeming to affect their minds. He used wine of ipecac, five drops every three hours, in cases of disordered stomach.

DR. PEPPER, in closing the discussion, agreed with Dr. Flint in referring certain cases to a toxic origin, but did not consider that this explained all the cases. It is important to remember that the generation within the system of the products of malassimilation is capable of producing convulsions. He would reassert the supreme importance of attention to dietetics and hygiene, without which no drug is of any avail.

DR. J. C. WILSON, of Philadelphia, then read a paper on the

DIAGNOSIS OF TUMORS OF THE ANTERIOR MEDIASTINUM.

He described this region as a physiological and anatomical "no-man's land," of very slight importance in health, but pathologically of great importance, and often neglected. The distinction which should be made between growths in the posterior and anterior mediastinum, for scientific diagnosis and treatment, is often overlooked. Disease is found in this locality in two forms: First, purulent inflammation of the tissues; second, new growths. Simple acute inflammation is unknown. There is one case on record of inflammation resulting in a solid exudation. Abscess, on the other hand, is not uncommon. The growths are divided into cysts (generally dermoid, and very rare), lipomata, fibromata, and osteomata, exostoses, tubercular disease in the glands, gummata and lymphoma, carcinoma, and sarcoma. Tubercular disease in the glands of the mediastinum is less frequent than in the bronchial glands and cannot be diagnosticated. The first mentioned of the above varieties are very rare; the last three are the most common. Carcinoma is always secondary in this locality, and primary sarcoma is rare. Lymphoma is the commonest form. It occurs in the glands, and rapidly involves the surrounding structures. It must attain a sufficient volume to press on the neighboring organs to be discovered. It is to be diagnosticated from aortic aneurism and tumors in the posterior mediastinum. Physical signs merely reveal the presence of a tumor, but do not show its special character. The symptoms are: pain of a superficial character, dyspnœa, scanty expectoration, and dysphagia, with paroxysmal intensification of the symptoms. There is no fever; nutrition is good, except when the œsophagus is pressed upon. Among the signs are: Repletion of veins of the face, prominence of eyes. livid lips, arborescent condition of varicose veins upon the chest, enlargement of the chest above the fourth rib, enlargement of the thymus gland, when present, and of glands in the axillæ, asymmetrical expansion of the chest on pressure, displacement of the heart, increased dulness over the upper part of the sternum corresponding to the size of the tumor, and dulness in the interscapular region, if the growth be large. The auscultation signs are somewhat modified. Cardiac sounds are feeble, though sometimes intensified over extra-precordial region over the tumor. There is no stridulous breathing, but enfeeblement of the respiratory murmur, if a bronchus of one side be obstructed. *The enlargement of the veins* distinguishes it from tumor of posterior mediastinum. Aneurism is excluded by the history, by the absence of thrill, by the early age at which the disease occurs, and by the stitch-like, superficial character of the pain. Pericardial effusion is excluded by the irregular outline of dulness, by its higher level, absence of fever, and by the history and progress of the case. Excision of the sternum has been resorted to with some success. The existence of malignant disease in other parts of the body is a great help in the diagnosis. Abscess may occur from blows, caries, or operations in the vicinity. There will be constitutional symptoms: Chill, fever, deep-seated pain, and pointing of the abscess. The paper concluded with some remarks on the rarer forms of disease in this locality.

DR. WM. H. WELCH, of New York, then read a paper on the

PATHOLOGY OF MYOCARDITIS.

The neglect of this disease by practitioners is caused partly by the difficulty of diagnosis and partly by absence of proper descriptions in the text-books. It is far more important than fatty degeneration, which generally receives a great share of attention, and many of the supposed symptoms of the latter are really due to disease of the coronary arteries. Many autopsies after sudden death, have shown the only appreciable cause to be lesions of these vessels. Myocarditis may be acute or chronic. The acute may be of a parenchymatous or interstitial type. The parenchymatous is a degeneration of tissue, and not properly an inflammation. The interstitial form may occur either as an abscess of the heart or as a non-suppurative inflammation. It may be circumscribed or diffuse. It may occur in the course of diphtheria or the acute infectious diseases. It is important to observe that *this disease occurs very often without the coexistence of either pericarditis or endocarditis.* The view that it is secondary to either of these diseases is incorrect. Fibroid myocarditis is generally associated with obstructive lesions of the coronary arteries, and may be caused by sclerosis or obliteration of the arteries or by thrombosis or embolism. Inflammation does not come first, but degeneration and atrophy. The disease is not referable to syphilis or chronic Bright's disease, and often attacks patients in well-to-do circumstances. He had made autopsies of myocarditis which may be clinically grouped as follows: *First*, where there was no symptom of heart disease. *Second*, sudden death without previous heart symptoms. *Third*, sudden death preceded by one or more attacks of angina pectoris. *Fourth*, with cardiac insufficiency of few days' standing. *Fifth*, in cases of old cardiac disease.

DR. FLINT, of New York, said that the cardiac symptoms and signs of this disease are purely negative—an

autopsy after sudden death alone revealing the existence of disease in the coronary arteries. In cases which we would diagnose as functional disease of the heart, it is well to make a mental reservation as to the possible existence of these lesions which might cause sudden death; but in such cases the chances are so strong that the disease is not present, and the importance of encouraging the patient so great, that it is wiser not to state our apprehensions.

DR. FRANK DONALDSON, of Baltimore, thought we might at least suspect the presence of the disease by the weakness of the cardiac impulse, by the sphygmograph, and by the existence of disease in other arteries.

DR. GASPAR GRISWOLD, of New York, then read a paper on

IRREGULAR APOPLECTIC ATTACKS FROM OTHER CAUSES THAN HEMORRHAGES OR EMBOLISM.

The paper contained records of cases in which patients had been attacked with all the symptoms of apoplexy, so as to deceive the attending physician into giving a grave prognosis, but recovered rapidly without any after ill effects. So closely was apoplexy simulated, that in a number of these cases there was not only unconsciousness, but transient hemiplegia. The author considered that the cause of the apoplectic attack in cases of hemorrhage or embolus, is a disturbance of the intracranial circulation. In cases of functional disorder, the same effect is temporarily produced, and therefore, at first sight, it is difficult to distinguish between them. He considered that cerebral anæmia was more frequently the cause than cerebral hyperæmia. The exciting cause may be prolonged anxiety, as in business matters, indiscretions in diet, etc. It is sometimes preceded by anæmia. The various cases were related in detail. The differential diagnosis is to be made by the short duration of the case. The only exception to this is in cases in which there is inequality of the pupils. This phenomenon Dr. Griswold considered to be proof positive of genuine apoplexy.

DR. E. G. JANEWAY, of New York, spoke of two similar cases which had been brought on by excessive smoking. On leaving off the use of tobacco there was no further return of the attack.

DR. AUSTIN FLINT, JR., of New York, spoke of the importance of the cerebral circulation in its influence on the symptoms in these cases. Loss of blood produces convulsions from the extreme exaggeration of the *besoin de respirer*. From his own experiments he thought this due to the cutting off of arterial blood from the medulla oblongata.

THURSDAY, MAY 8—THIRD DAY.

DR. AUSTIN FLINT, JR., of New York, read a paper entitled

THE DIETETIC TREATMENT OF DIABETES MELLITUS.

He said that it occasionally happens that the presence of sugar is detected in persons who seem to be in thoroughly good health, though this is very rare. From an extensive experience in examining for life insurance, he would estimate that it occurs in one person out of every three hundred and seventy-seven persons. In most cases attention is called to the trouble by the symptoms. There are thirst, polyuria, dryness of the feces and of the skin, weariness on exertion, etc. Pruritus of the vulva is an extremely common occurrence, and, when not explicable otherwise, should always lead to an examination of the urine. The usual symptoms, however, are not always all present by any means. As to the detection of sugar in the urine, which is, of course, *the sign* of the disease, he said that the great desideratum has been a test that would be simple and easy and yet accurate. Fehling's test when accurately used is certain, but it is apt to become inoperative when the solution is kept for a long time. He considered that two liquids which had been prepared by Squibb, of New York, answered every requirement. Without taking the time to describe them fully, he gave the method by which they should be used. Mix equal parts of the two fluids and pour the mixture into a test-tube to the depth of an inch. Bring it to a boil. Then add an equal part of urine and bring the mixture thus made to a boil. Then allow it to cool. These steps are most important to be observed. If on cooling there is no distinct opaque yellowish or reddish precipitate, there is no sugar. The promptness and amount of precipitate indicate aproximatively the amount of sugar. For the more accurate determination of this, the differential density method of Roberts is good. The specific gravity of urine has no definite relation to the amount of sugar. Owing to the proportion of urea, diabetic urine may have a specific gravity as low as 1011. Normal quantity and specific gravity of urine do not *exclude* the existence of diabetes.

The author then touched upon the symptoms, etc., of the disease, and to some extent upon the glycogenic function of the liver. In this connection, he said that he thought his own experiments had harmonized with those of Bernard and Pavy. He believed that sugar was formed in the liver, but was very rapidly washed out of the organ by the blood current. The discovery of Bernard, however, had not thrown the light upon the etiology of diabetes that had been hoped at first. Besides the sugar from the liver, we have the sugar resulting from digestion. In diabetes much of this is discharged through the kidneys. The failure of the body to consume the hydrocarbons results in a loss of heat. The temperature is below normal. He spoke of a patient of his whose temperature is 96.5° F. How far can diabetes mellitus be treated? Cantani says, "Diabetes has become a disease *easily and certainly curable*, if treatment be not begun too late." Dr. Flint did not think this statement extravagant when we consider the results of the dietetic treatment, provided it be submitted to. A cure is the result or, at least, a removal of the symptoms, except an occasional slight glycosuria. Our main reliance is upon diet, which must be one that *absolutely excludes starch and sugar*. This is difficult to enforce. There is often a craving for starchy food, especially bread. There are numerous so-called antidiabetic breads, which are said to contain no starch. Dr. Flint has had many of them analyzed. They are all frauds, sometimes containing more starch than ordinary bread. If the patient will not submit to the diet, he may be allowed a piece of the crust of a roll with plenty of butter twice a day, under protest. The craving for starchy food and for sugar diminishes. It is difficult to make a diet-table of foods that do not contain these ingredients, but it can be done, especially if

the patient be in well-to-do circumstances, and he may live even luxuriously. Even in mild cases this rigid regimen must be kept up for at least two months. Then a gradual return to usual diet may be allowed, the urine being examined every five days, and the strict diet at once enforced if any sugar be found. As regards general treatment, the action of the skin must be excited, general untiring exercise, a mild course of training, massage, Turkish or Russian baths, may all be tried in cases in which they are not contraindicated. The patient must not drink much. The anti-diabetic diet will lessen the thirst. The sucking of cracked ice is good. Alcoholic drinks are injurious and should be avoided, especially champagne and spirits are to be interdicted. If something of the kind must be taken, claret in small quantities is the best. The patient cannot bear sustained effort, and all causes of mental anxiety must be avoided. As a rule, the insomnia does not require narcotics. When boils appear, sulphide of calcium is of great benefit, though it does not affect the disease itself much. The lowered temperature of the body makes great care necessary to avoid taking cold.

The medicine which he recommended chiefly, was Clement's solution of the arsenite of bromine, in three-drop doses three times a day in a wine-glassful of water (two drops represent one-twenty-fourth of a grain of the salt). The system can tolerate this drug for months. But no drug will be of use without diet. Patients should be informed that they are suffering from a serious disease and must follow directions. There is always danger of a relapse.

DR. H. F. FORMAD, of Penna., then read a paper on

TUBERCULOSIS.

The author regretted that his remarks on this occasion had to precede the publication of investigations which he had recently undertaken in the laboratory of the University of Pennsylvania. These investigations will soon be published, with full details of the methods adopted, etc., and will substantiate the views he was about to announce. He hoped the Section would understand that he did not regard the question as a personal one; he wished to learn, and would take any objections in good part.

The recent advances in mycology have received great attention among investigators, especially the discoveries of Koch in regard to the tubercle bacillus. These are of great importance and demand close consideration. He would divide the subject into three headings: (1) The contagiousness of tuberculosis; (2) a brief definition of Koch's present position; (3) objections to Koch's theories—which objections remain unanswered.

(1) *Contagiousness.* This is a most important question, clinically and socially. Besides this, the acceptance of the bacillus theory hangs upon the contagiousness of tuberculosis. If the disease be not contagious, the parasitic theory of the disease falls to the ground. There is no satisfactory clinical evidence of the contagiousness of the disease. The cases that have been reported in which the wife or the husband contracted phthisis after nursing the partner who had consumption are only seeming exceptions, for scrofulosis may be acquired by unhealthy surroundings. Besides this, the great prevalence of consumption makes it necessary to show that the individuals who are said to have been infected were not by inheritance predisposed to the disease. The theory that children become scrofulous by contagion from phthisical parents is untenable, for they will become scrofulous even if they are taken from their parents. The investigation made under the auspices of the British Medical Association, showed that out of 1028 cases of consumption 623 furnished no evidence of contagion, and only 261 seemed to be in favor, but among these the causes of error (family history, surroundings, etc.) were not eliminated. Isolated instances of apparent contagion cannot be placed against the thousands of cases of the closest intimacy between the diseased and the well, without any spread of the complaint whatever. The experiment has been tried of direct inoculability of the disease in man. There is a celebrated case in which a man already half dead was inoculated. He died in three weeks. Laennec inoculated himself, and *twenty years afterward* died of tuberculosis—and this is cited in support of the contagion theory! Bearing on this we have experiments, in Würzburg, where the sale of tuberculous meat is not prohibited. Whole families were fed on the infected meat—often using it raw. They were under supervision for many years. Yet in no case did consumption occur—in fact they throve on the diet.

Neither is there analogy between tuberculosis and other contagious diseases. If we claim immunity from the latter, we know how it comes, either from a previous attack of the same disease, as in scarlatina, etc., or from other processes (as in vaccination). This is not the case with tuberculosis. If there is immunity, it is in the system. Predisposition also is constitutional, as can be proved both by macroscopical and microscopical appearances in the scrofulous child. Beside congenital predisposition, there may be an acquired predisposition. This may be brought about by unhygienic surroundings, etc. Tuberculosis also may be acquired by injuries of the serous membranes even without external openings, as in pleurisy, etc. Cohnheim gave a fresh impetus to the theory of contagion. He succeeded in inducing tuberculosis by injecting tuberculous matter into the eye, while innocuous substances did not produce the disease. In publishing these experiments, he slurred over his former experiments with innocuous substances in the peritoneum which had produced tuberculosis.

(2) *Koch's Theory.* Koch has proved that in all tuberculous deposits, whether in the lung or in organs secondarily affected, the tubercle bacillus is found, and that this bacillus is not found elsewhere. He says the bacillus is chiefly found in the youngest tuberculous deposits. He then by his culture methods isolated the bacillus, and with the bacillus obtained by culture he inoculated healthy animals and produced tuberculosis and found the bacillus present. He inoculated other animals from these, and again produced tuberculosis. This bacillus only thrives in animal substances and at the temperature of the body. From these facts he concludes that this bacillus has the same causative relation to tuberculosis that anthrax bacillus has to splenic fever. If all he claims is true, he has satisfied the scientific requirements of the case. But while his facts are true, his conclusions are faulty. Koch the mycologist is right, but Koch the pathologist is in error. The evidence is not yet all in, and we must pause before we accept his teaching.

(3) *Objections to Koch's Theory.* These are not personal in any sense. The etiological relation between the bacillus and tuberculosis is not evident, because the bacillus, while usually present, is not found in all cases, and sometimes when it is found there may be only one or two bacilli in one section; that is, they are not in sufficient quantity to be considered causative. Again, the weight of evidence, and with this Dr. Formad's experiments agree, is that they are most frequently found in old cases and are not so often present in the beginning of the process—in fact, are often absent. But if Koch is right, the bacillus should be present in all cases, especially in the early stages. The truth is, the bacillus is a mere concomitant of degenerated cheesy materials. Even Koch allows that pus without the presence of the bacillus when inoculated from tuberculous deposits may cause tuberculosis, but he suggests the existence of spores. This is a mere assumption which can neither be proved nor disproved. May it not be true that the cheesy deposits furnish a suitable soil for the bacillus to grow upon, and that without this soil they will not grow?

It has not been proved that the disease as produced in the lower animals is identical with the disease in man, although the bacillus in both may be the same. The lesions are not always tubercular. Those resulting from the inhalation-experiments, which showed the presence of miliary nodes in the lungs, have been shown to be merely foci of catarrhal pneumonia. The nodes are simply inflammatory products which can be wiped out with a camel's hair-brush, leaving healthy lung. Some of Koch's experiments are of the same character. They only relate, at any rate, to rapidly produced tuberculosis. If sufficient time be allowed, any substance will produce the disease in animals predisposed to it. Again, experiments on animals cannot be made to prove anything in regard to man, nor can the effect of an experiment on one animal be predicated from its effect on other animals.

We are too apt to forget that the question is not whether the bacillus produces tuberculosis, but whether other and innocuous substances can produce it. Koch's proof-experiments in this direction are valueless. As there is good evidence that the disease can be produced by innocuous substances, it is not fair to assume that the bacillus must have entered somehow. Tuberculosis may exist without the bacillus, and *vice versâ*. Either, then, Koch is wrong on anatomico-pathological grounds, or tuberculosis must be reclassified into that with and that without the bacillus.

In conclusion, neither the specific action of the bacillus nor of tuberculosis is proved. The bacillus is valuable in diagnosis, but it has no bearing upon the etiology of the disease. On social grounds, the acceptance of the bacillus theory would be disastrous. There is a poison in tuberculosis, but it is generated by the body itself. Tuberculosis bears an analogy to carcinoma from a pathological point of view.

DR. AUSTIN FLINT, of New York, said that the contagiousness of phthisis is a side issue. If tuberculosis be caused by a parasite, it is contagious, and clinical facts must be explained in accordance with this view. The question is: 1. Is there a parasite? Yes. 2. Is it uniformly present? The burden of testimony goes to show that it is, so that the exceptions may almost be put down to the want of skill in the observer, or some accidental cause. 3. Is the bacillus found in morbid products, not tuberculous? As a rule, no. 4. Can tuberculosis be produced by this parasite alone in the lower animals? Yes. Dr. Formad assumes that the disease may involve a parasite, but not be due to the parasite. This is opposed to the general laws observed in parasitic disease. If a parasite be proved to bear a causative relation to tuberculosis, it must be the cause *par excellence*, though predisposing causes may exist, and help.

DR. WELCH, of New York, said that the necessary proofs for the bacillus theory of tuberculosis are forthcoming. The bacillus is almost constantly present in the disease. It has been isolated, and has produced tuberculosis, and inoculation with other substances does not produce it. When Koch first published his discovery, reports of cases in which the bacillus was absent were frequent. They are now becoming more and more rare, as the skill of the operators is improving. All observers admit that it is present as a rule.

He defended Cohnheim's experiments on the eye, referred to by Dr. Formad, and said that, so far from slurring over his experiments on the peritoneum, Cohnheim repeated them with greater precautions, and found them unsuccessful. Is it certain that the lesions produced by innocuous substances are really tubercular. To prove them so, they must contain the bacilli, and be able to convey the disease. This is not, he said, a *petitio principii*, as the presence of the bacillus in tuberculosis is proved. So far from the parasite not being present in recent cases, it is most frequently present in such lesions.

DR. GEORGE M. STERNBERG, U. S. A., was inclined to think that the bacilli might act as the carriers of infection. They needed a tubercular soil. Dr. Formad's theory of their acting as irritants is worthy of consideration. He would like to know whether the bacilli were found in cases in which innocuous substances had produced the disease, and had the disease the same history as when caused by inoculation with the bacillus. He thought the bacillus necessary to cause cheesy degeneration and auto-infection. In regard to Dr. Formad's experiments, if they were really carried on with all possible precautions, and the animals experimented upon kept isolated, then the bacillus is not the only cause of tuberculosis. He had doubts, also, as to whether Koch's method of cultivating the parasite upon the surface of the culture-material was likely to produce a perfectly pure bacillus.

DR. R. H. FITZ, of Massachusetts, said that Koch's view is, that the inflammations themselves are the result of the bacillus. In regard to Dr. Formad's experiment with innocuous substances, there must have been some error. The air of pathological laboratories is full of bacilli.

DR. JAMES TYSON, of Pennsylvania, was disappointed that Dr. Formad had not given his experiments to the Section. He was yielding more and more to the accumulating evidence in favor of the bacillus, and referred particularly to the experiments of Fischer, published in Koch's last report, in which sterilized and non-sterilized tuberculous sputum was used, the former causing tuberculosis when inoculated, the latter not. He did not think that tuberculosis must, therefore, be contagious. It may be infectious, as malarial fever is.

DR. JANEWAY, of New York, agreed with Dr. Welch.

In respect to contagiousness, he did not think that the clinical side of the question should be discarded. His clinical experience had induced him to believe in the contagiousness of the disease. This, so far from being a social injury, will be a social benefit, as preventive measures can be taken. He detailed several cases to prove his point. Among others, he mentioned the case of three dogs who were petted in succession by a tuberculous master, who took them to bed with him, and all of them died with symptoms of phthisis.

DR. CHARLES DENNISON, of Colorado, spoke of the analogy between tuberculosis and fibroid condition of the lung and also croupous pneumonia. The distribution geographically of croupous pneumonia and consumption is very nearly alike. He showed four carefully prepared maps of the United States, on which the relative dampness, etc., of the various sections were diagramatically represented by various colors. He divided the country into regions of (1) excessive dryness, (2) moderate dryness, (3) excessive moisture, (4) and moderate moisture. The four maps represented the state of different parts of the country during the four seasons. He considered that the infectious principle is favored by dampness and heat, and that dryness and cold are inimical to it. This is the reason why elevation is so good for phthisis.

DR. E. O. SHAKESPEARE, of Philadelphia, summed up the proofs in favor of the microörganism of tuberculosis as causing the disease, and criticised Dr. Formad's method of investigation and the precautions he used, thinking that his conclusions were not well founded.

DR. G. C. SMYTHE called attention to the varieties of infectious diseases. The first are purely contagious, as smallpox; the second are infectious not directly, but the germ must come to maturity outside of the body, as in typhoid fever; the third are miasmatic, as malaria. If we assume that all infectious diseases are the result of microörganisms, which act as specific poisons or as carriers, a predisposition on the part of the individual is still necessary. Some families show great susceptibility to certain diseases, *e.g.*, diphtheria. Perhaps tuberculosis might be classified with the local contagious diseases, as syphilis, leprosy, etc., commencing at a certain focus, and thence infecting the whole body. He thought Dr. Formad admitted too much for his own argument.

DR. HAROLD C. ERNST, of Mass., spoke of the various methods of staining the bacillus. He condemned Gibbs's method, and thought Frænkel's only partially satisfactory, but praised Koch's last method, and Ehrlich's.

DR. WILLIAM PEPPER, of Penna., had paid much attention to the literature of the subject, and held his judgment in suspense. In regard to the character of Dr. Formad's address, he was largely responsible for it, as he advised him not to give an account of his recent unpublished experiments. Dr. Pepper wished to lay stress upon the carefulness and conscientiousness of Dr. Formad's work. His personal knowledge of this gave him the right to speak thus in answer to Dr. Formad's criticisers. He was sorry so little original work has been done in this country in this direction. He thought clinical evidence was an important part of the question. His experience had been positively in favor of the non-contagious character of tuberculosis.

DR. TRAILL GREEN, of Penna., spoke strongly in favor of the non-contagious character of phthisis from a clinical experience of half a century.

DR. TILLEY, of Illinois, thought the chemical side of the question had been lost sight of. The chemical character of the soil the bacillus grows on should be carefully studied.

DR. FORMAD thought that Koch had not made out his case fully, and that it brought others into misconceptions to rely upon his statements. He said that he had taken especial pains to avoid error. His animals were better cared for, and in purer air than Koch's. Those animals experimented upon with innocuous substances are taken to the country.

The Section then adjourned.

AMERICAN LARYNGOLOGICAL ASSOCIATION.

Sixth Annual Congress, held in New York, May 12, 13, and 14, 1884.

(Specially reported for THE MEDICAL NEWS.)

MONDAY, MAY 12TH—FIRST DAY—MORNING SESSION.

THE PRESIDENT, DR. FRANCKE H. BOSWORTH, of New York, delivered an address of welcome, and afterwards read a paper on

THE CLINICAL SIGNIFICANCE OF FIBRINOUS EXUDATIONS UPON THE MUCOUS MEMBRANE OF THE UPPER AIR-PASSAGES.

Among his conclusions were the following:

That a fibrinous exudation which occurred on the crypts of the follicles of the faucial or pharyngeal tonsil, or of the mucous membrane of the lower pharynx, had no tendency to extend, and belonged to a disease which was self-limited, and not dangerous in its tendencies.

That a fibrinous exudation which occurred upon the surface of the tonsil, or of the mucous membrane of the fauces, constituting a so-called croupous membrane, presented gross appearances, by which it could be immediately recognized.

That croupous membranes on the fauces of an adult marked the existence of a disease which, while being undoubtedly a blood-poison, was still a self-limited infection, and involved no danger to life.

That a croupous membrane forming in the fauces of a child marked the occurrence of the same disease as croupous membrane in an adult; but in the child there was the additional danger of a new centre of development occurring in the larynx, where it might involve the greatest danger to life, though entirely as a mechanical obstruction to respiration.

That a diphtheritic membrane developed in the fauces marked the occurrence of a disease which was dangerous to life, not only from primary and secondary septicæmia, but also from the tendency to the development of the same morbid process in the larynx.

DR. BEVERLY ROBINSON, of New York, took exception to Dr. Bosworth's views in regard to the question of follicular tonsillitis, so called, appearing as an essential fever. From a clinical point of view, he thought that this was a mistake, because, while it was certainly true that in a certain number of instances, particularly in children, the fever lasted for a number of days, and was

evidently connected with the appearance of cheesy masses over the follicles of the tonsils, yet in quite as large a number of cases the fever was of very short duration. Again, the pathological appearances of the exudation from the interior of the follicles did not, he thought, resemble, microscopically, the condition to which Dr. Bosworth alluded in speaking of the true croupous membrane, and did not in reality partake of the nature of an exudation, which was generally regarded as of a fibrinous character. With regard to the question of croupous tonsillitis, he would remark that while there might, perhaps, be many cases in which the membrane itself did characterize the type of a disease which was not a constitutional affection, he had seen cases in which the mucous membrane did not seem to be incorporated with the false membrane itself, and in which the cases seemed to be of mild type, but after a few days became very serious. The membrane, which at first was white and easily detached, afterward became dark and so attached to the underlying tissue that he could not say the case was not one of diphtheria. As regards the origin of these affections in the local absorption of certain germs, he could only say that while they had a theoretical basis, they were, to his mind, far from proved.

DR. WILLIAM C. JARVIS, of New York, said that he could, for the most part, substantiate the views of Dr. Bosworth as regards the gross pathology of the exudation met with in the upper air-passages. His attention was first called to inflammation of the pharyngeal tonsil by the occurrence of the affection in his own person several years before. A feature of acute follicular pharyngitis which did not seem to have received any attention was one in which the secretion was retained; eventually escaping upon rupture of the membrane, and covering the pharynx with a white membrane. Such a change did not occur when the inflamed follicles remained patent.

DR. F. I. KNIGHT, of Boston, wished to call attention to an important practical point which he thought escaped the attention of physicians very generally in these acute affections of the upper air-passages. This was the increased susceptibility to diphtheritic infection during the existence of any simple acute inflammation of the air-passages, and it was a fact which induced him to give a guarded prognosis in even simple, acute affections, such as follicular pharyngitis or ordinary pharyngitis.

The paper was also discussed by Drs. J. N. Mackenzie, J. H. Hartman, and F. Donaldson, of Baltimore; E. L. Shurley, of Detroit; and S. W. Langmaid, of Boston.

DR. BOSWORTH said that he must take exception to Dr. Robinson's statement that follicular tonsillitis, in any sense of the word, was characterized by cheesy deposits in the crypts of the tonsils. The resemblance of the exudation to croupous membrane was sufficiently close to warrant us in the conclusion that the two conditions were very nearly allied, if not identical, the difference being only such as one would expect to find —the membrane in the one case being deposited on the surface, and in the other being confined to the small crypts going to make up the tonsils. The points which he wished distinctly to emphasize were, *first*, that we could, by examination, throw a great deal of light on the clinical tendencies of inflammatory diseases of the fauces (a careful examination leading to a correct diagnosis); and, *second*, that mucous membrane which was in a state of acute catarrhal inflammation offered a favorable nidus for the occurrence of diphtheritic deposit, without there being any necessary connection between the two processes. The catarrhal condition was not the prodromal stage of the disease.

DR. JOHN N. MACKENZIE, of Baltimore, presented

A CONTRIBUTION TO THE STUDY OF CONGENITAL SYPHILIS,

which was, to a considerable extent, based on a case of this disease which had come under his observation. The child remained healthy from the first to the third year, when interstitial keratitis of both eyes (which continued for two years) was the first trouble to become developed. After a time paralysis of both eyelids set in, all muscular control of the lids being lost. Then followed intense occipital cephalalgia, which lasted over a month, when, together with the paralytic trouble in the eyelids, it was completely relieved under medical treatment, the exact nature of which Dr. Mackenzie did not know. Internal strabismus of the right eye next became developed, and this was accompanied with deafness of the right ear, from which there was now a slight purulent discharge. Then came ulceration of the tonsils and pharynx, with dysphagia, complicated by inflammation of the right lachrymal sac and very extensive ulcerations of the hard palate, also with pus and constant muco-purulent discharge. It was not possible to make a laryngoscopic examination, but there was absolute aphonia. The ulcerations advanced, in spite of all treatment, until the child was taken with a mild attack of scarlet fever; when, as a result of this, all the symptoms, including the aphonia, were markedly relieved for a considerable time. The child next had an attack of acute pneumonia, which lasted about four weeks, and when it was examined afterwards, it was found that the hard palate was covered with cicatrices, while the breathing was entirely through the nose.

There were two features about the case to which Dr. Mackenzie wished to direct special attention. The first was that, while deep ulceration of the lower pharynx was not infrequent, such a degree of stenosis as was met with in this patient was exceedingly rare. He knew of but two other cases on record. The second was the paralysis of both upper eyelids. This, he could not doubt, was of cerebral origin, and he thought it was probably due to the presence of a gummatous tumor.

He then referred to a paper of his, published in the *American Journal of the Medical Sciences*, for October, 1880, on "Congenital Syphilis of the Throat," which was based upon the study of one hundred and fifty cases, and stated that the opinions which he had therein expressed, had only been strengthened by the further experience that he had had since its publication, as well as by the observations of others. He believed that laryngeal disease was one of the most constant and characteristic of the pathological phenomena of congenital syphilis, and that one might look for invasion of the larynx with as much confidence in the congenital, as in the acquired form of the disease. There

was every reason to believe that such inflammations had frequently been confounded with simple and fibrinous laryngitis, and their dependence on syphilis overlooked.

The following propositions were then advanced:

First. In congenital syphilis deep ulceration may invade the pharynx and naso-pharynx.

Second. When the eruption of constitutional syphilis is apparently delayed, the pharyngeal and laryngeal affections are apt to be more serious.

Third. Females are attacked more frequently than males. Out of sixty-nine cases of pharyngeal ulceration, forty-one occurred in females.

Fourth. Ulceration may occur in any situation, but its favorite seat is the palate, especially the hard palate, for which it manifests the closest elective affinity.

Fifth. When ulceration occurs at the posterior part of the hard palate, the tendency is to involve the soft palate and velum, and thence to invade the naso-pharynx and posterior nares.

Sixth. The next most common seats of ulceration in their order of frequency, are the fauces, the naso-pharynx, the posterior pharyngeal wall, the nasal fossæ and septum nasi, the tongue and gums.

Seventh. Ulcerations, especially those of the palate, show a tendency to centrality of position, together with a special tendency to caries and necrosis of the bone.

Eighth. The tendency to necrosis exists at all periods of life.

Ninth. While deep pharyngeal ulceration generally precedes or coexists with similar affections of the larynx, the latter occurs also without evidence of pre-existing pharyngeal lesions.

Tenth. Laryngeal ulceration does not commonly follow the pharyngeal destruction of latent syphilis; those palato-pharyngeal ulcerations which are found in tardy congenital syphilis having little tendency to invade the larynx, but rather to infiltration of the naso-pharynx and nose.

Eleventh. Simultaneous or consecutive ulceration of the palate, pharynx, and nose seems to be characteristic of syphilis, or, at least, seems more frequent in this than in any other disease.

The throat ulcerations of congenital syphilis, he continued, showed a tendency to rapid progression which was often beyond control. But they sometimes subsided as if by magic on the appearance of some acute exanthematous disease. It was to this point that he particularly wished to call attention. While congenital syphilis afforded no protection against such affections, it did seem undoubtedly to mitigate the violence of the attack. Thus, scarlet fever, measles, and chicken-pox all seemed, as a rule, to exert a favorable effect on the throat-lesions of congenital syphilis, so that it was probable that the poisons of these diseases were mutually destructive. These remarks were not, however, appropriate to diphtheria, to which the victim of congenital syphilis was apt to succumb rapidly; the presence of the inherited disease greatly increasing the danger from this affection. The remarkable effect of erysipelas on the syphilides had been noted by a number of authors, and some had even proposed inoculation with erysipelatous virus as a therapeutic measure in obstinate cases of syphilis. It seemed, therefore, that there was a well-marked antagonism between congenital syphilis and certain acute exanthematous diseases. In the course of the paper, Dr. Mackenzie stated that there was no difference between the so-called scrofulous and syphilitic ulceration of the throat. Syphilis, tuberculosis, and lupus had been indiscriminately ascribed to scrofula in the matter of such lesions; but apart from these diseases, which were distinct from struma, there was no reason to believe in an ulcerative scrofulide of the throat.

DR. E. L. SHURLEY, of Detroit, could not agree with Dr. Mackenzie in regard to the identity of scrofula and syphilis, and thought that in the present state of our knowledge it was necessary to admit the tubercular, syphilitic, and scrofulous origin of the lesions referred to. While the pathological appearances of the lesions were often much the same in scrofula and syphilis, clinically, he thought, there was a very wide difference in these two diseases, both in children and in adults.

DR. MACKENZIE said, in reply, that Dr. Shurley had very much misunderstood him if he thought he said that scrofula and syphilis were the same. The idea that he intended to convey was, that there was no point of difference between the so-called scrofulous throat ulceration of the French writers, and that of congenital syphilis. Neither was there any difference between such scrofulous ulceration of the throat and that due to tuberculosis or lupus.

DR. HARTMAN related the case of a child, four years of age, suffering from congenital syphilis, who had an attack of measles, by which the ulceration existing in the naso-pharynx, so far from being alleviated, was considerably aggravated. After it had recovered from the measles, consequently, the throat was left in a worse condition than before the attack. This, of course, was only a single case; but it went to show that such cases were not always benefited or controlled by the intercurrence of an acute exanthematous disease.

DR. DONALDSON remarked that he had understood the author of the paper to question the existence of scrofulous ulceration of the throat in young children not connected with congenital syphilis. He then related a case now under his care, a child of five years of age, the son of a healthy farmer, who had, with a large ulcer of a scrofulous character over the soft palate, unmistakable evidences, such as enlargement of the lymphatic glands, etc., of scrofula, and none of the usual symptoms of congenital syphilis.

DR. KNIGHT said that his experience in this class of cases was very limited, but he believed, with Dr. Mackenzie, that a careful search for the origin of the trouble present would reveal the history or certain evidences of syphilis, and, if not of that, of tubercle. As in the adult, we could not always, perhaps, get a satisfactory syphilitic history, but antisyphilitic treatment generally yielded such results as to justify us in considering the disease to be of a syphilitic nature.

DR. BOSWORTH remarked that the more experience he had in the matter, the more convinced did he become that, as far as the mucous membrane of the air-passages was concerned, there was no difference between the ulceration of congenital syphilis and scrofulous ulceration. He said that he would have been glad if Dr. Mackenzie had directed some attention to the question of treatment. In his own practice (so far had

he become convinced of the identity of the two conditions), he had of late years depended almost entirely upon the administration of mercurials, and in many cases the results had been eminently satisfactory. This seemed to him additional proof of their identity.

DR. MACKENZIE, in closing the discussion, said that he had especially avoided generalization in his paper, and had only stated that, in his experience in this class of cases, the ulceration was often cured or relieved by an acute intercurrent disease. In Dr. Donaldson's case, he did not see how a diagnosis was to be made between syphilis and scrofula, and Dr. Knight had pointed out how difficult it often was to get at the facts of a syphilitic history. With regard to treatment, he was in the habit of relying upon mercurials and the iodide of potassium, using iodoform locally.

APPOINTMENT OF COMMITTEES.

Before adjournment, the Chair appointed on the *Nominating Committee*, Drs. Knight, Lefferts, and J. Solis Cohen; and on the *Auditing Committee*, Drs. Mackenzie and Hooper.

ELECTION OF NEW FELLOWS.

Drs. S. Solis Cohen, of Philadelphia, and Clarence C. Rice, of New York, recommended for membership by the Council, were then duly elected Fellows.

AFTERNOON SESSION.

DR. J. O. ROE, of Rochester, N. Y., read a paper on

RETROPHARYNGEAL ABSCESS.

Having alluded to the location of abscesses in general, he said that the post-pharyngeal connective tissue was liable to this affection, first, on account of its low vitality; and, secondly, on account of its looseness. Retropharyngeal abscess might originate either in the soft tissues, or from necrosis of the cervical vertebræ, and the former variety might have its origin either in the glandular structure or in the areolar cellular tissue. Having given a sketch of the anatomy of the parts, and especially their glandular connection, he mentioned the causes of retropharyngeal abscess as being either (1) idiopathic, (2) traumatic, or (3) secondary. Among the first were included cold, nasal catarrh, retropharyngeal lymphadenitis, and the scrofulous, tubercular, and syphilitic diatheses. Traumatic abscesses were such as were caused by direct wounds, or by injury from the swallowing of bones, and other similar accidents. Those of secondary origin were such as were dependent on tonsillitis, pharyngitis, or other local affection in the vicinity.

Among the symptoms were mentioned dysphagia and dyspnœa, and the latter might be so urgent as to necessitate tracheotomy if the true nature of the trouble was not recognized. Convulsions were sometimes caused by it in children. Among the other symptoms mentioned as liable to occur were facial paralysis, soreness about the palate, stiffness and swelling of the neck (the head being often bent to one side, if the abscess were laterally situated), and œdema of the larynx, which sometimes caused sudden death. In the diagnosis of this affection, it was necessary to differentiate it from croup, the presence of foreign bodies in the throat, œdema of the larynx, and even enlarged tonsils. The voice was always more or less altered, and in children it might be altogether extinguished. A correct diagnosis could only be arrived at by careful inspection and digital examination. Lipoma of the pharynx had sometimes been mistaken for retropharyngeal abscess, and in one case, in his own practice, the diagnosis of the former had to be established by an exploratory incision. When there was much dyspnœa, the head was usually bent backward considerably. The prognosis was least fatal in the idiopathic variety, much more so in the secondary.

The only treatment for retropharyngeal abscess was prompt evacuation. There was some danger of sepsis supervening, and, therefore, it had been recommended, by some, that a canula should be employed to remove the pus. Dr. Roe thought it well, in some cases, to make quite a small incision at first, as advocated by Allis, for fear of some of the contents of the abscess getting into the larynx, and afterwards enlarging it so as to insure complete maceration of the sac.

Having mentioned that the disease was practically one of infancy, fully one-half the cases occurring in the first year of life, he related three cases which he had been called to see in consultation. The first was in an infant, nine months old, who was supposed to be suffering from diphtheretic croup. There was, however, an entire absence of the constitutional disturbance characterizing this affection, and a careful examination soon revealed the true state of affairs. In this instance there was marked swelling of the neck, extending from the clavicle to the ear, on the left side. He made a small incision at first, so as to allow the pus to escape slowly, and at the same time bent the head forwards; later making the incision larger. There was no return of the trouble, although the child had been weak and cachectic from birth.

The second patient was ten months old, and had had an attack of scarlatina two weeks before the occurrence of the retropharyngeal abscess. There was still remaining considerable coryza and conjunctivitis. One evening it was noticed that there was considerable difficulty in breathing and in swallowing, and that the voice was markedly altered. The attending physician feared that diphtheria was setting in, but the presence of the abscess was recognized by Dr. Roe, who made an incision in the same manner as in the preceding case, after which there was no further trouble.

The third case occurred in a student, twenty years of age, who, after attending a class supper, suffered from headache, diarrhœa, and sore throat. The neck was considerably swollen, and Dr. Roe found that there was a retropharyngeal abscess. This was freely opened, but the pus burrowed downwards in the tissues, so that the abscess became retro-œsophageal. There was a very profuse discharge, and the inspiration sounded as if the patient was breathing through soap-bubbles. He died from exhaustion on the third day.

DR. T. A. DE BLOIS, of Boston, said that he also had had three cases of retropharyngeal abscess. What had impressed him most in connection with all of them, was that the head was carried very far backward, so that this of itself made the diagnosis an easy one, and he thought that Dr. Roe had hardly laid sufficient stress upon this point. One of the cases was in an adult, and the other two in children; and in one the

incision had to be carried through the posterior pillars of the fauces. He did not agree with Dr. Roe in regard to the small incision, but thought that it should be free, and the pus at once evacuated; though after the incision the head should be forced down.

DR. S. JOHNSTON, of Baltimore, wished to call special attention to the advantages of the free horizontal incision in retropharyngeal ulcers. In the case of a child he had made this, and then inverted the patient; at the same time carrying his finger into the throat. The result was the complete and satisfactory evacuation of the abscess; nearly a wine-glassful of pus escaping.

DR. W. C. JARVIS, of N. Y., thought that more stress should be laid upon the occasional occurrence of retropharyngeal abscess in connection with ordinary phlegmonous tonsillitis. A case of this kind had come under his observation, in which this condition existed, along with acute suppuration of the tonsil, and almost resulting in the strangulation of the patient.

DR. GEORGE M. LEFFERTS, of New York, said that one clinical fact, well observed, was worth pages of theory. Who of those present, he asked, believed that nasal catarrh in children was even a cause of retropharyngeal abscess? Or, if it was, why was the latter not oftener met with? Having expressed doubt as to tuberculosis of the pharynx (in itself so extremely rare that some denied its occurrence altogether) or injury to the posterior pharyngeal wall ever being causes of this trouble, he went on to say that retropharyngeal abscess, apart from that form arising from caries of the vertebræ, was probably due to a simple phlegmonous inflammation of the cellular tissues in front of the spinal column. As to the matter of diagnosis, it seemed to him that there was little value in speculating whether the patient's head was held forwards or backwards, whether inspiration or expiration was most affected, and the like variety of symptoms that had been alluded to. One look into the patient's throat was sufficient. Few conditions could be confounded with retropharyngeal abscess; a suppurating gumma was one. In treatment, again, why not sum up the matter in one word by saying that retropharyngeal abscess must be treated upon the same surgical principles as an abscess elsewhere in the body—open it and discharge its contents? The affection, he thought, must be very rare. In literature comparatively few examples were met with, and in all his experience he had seen but two examples. Both were in young children, and both were operated upon by simple incision. There was no difficulty in the diagnosis, and both recovered.

DR. J. SOLIS COHEN remarked that the danger of suffocating the patient on incision of the abscess might be avoided by operating with the head pendent. As to the horizontal incision recommended by one of the speakers, he believed that the danger of leaving a pocket in the lower portion of the abscess, in which pus might accumulate, had been mentioned by some authors as a reason for prefering the vertical incision.

Remarks were also made by Drs. Donaldson, Major, Lincoln, Mackenzie, Ingals, and Chamberlain, and the discussion was brought to a close by Dr. Roe.

CONGENITAL WEB OF THE VOCAL BANDS

was the title of a paper read by DR. T. A. DE BLOIS, of Boston. The patient was a young woman twenty years of age, whose voice had always been weak and puerile. She was first under the charge of his colleague, Dr. Fowler, and afterwards came under his own care. She had a very dependent epiglottis, and on account of the extreme irritability of the parts it was very difficult to get any view of the larynx for a long time. When the intolerance had been partially overcome by a course of education, it was found that over the anterior half of each vocal band there was spread a strong white web, the appearance of which was shown in colored drawings exhibited by Dr. De Blois. He determined to break up the adhesions, if possible, and so introduced Mackenzie's forceps for the purpose. Instead of tearing the web, however, the instrument merely scratched it; but in a subsequent attempt he succeeded in splitting it across by the same means, leaving a jagged, dentated edge on each side. The next day he found, to his chagrin, that the torn surfaces had again united; but he afterwards ripped up the new cicatricial tissue with a probe. The treatment of expansion had been continued by Dr. Fowler, and the voice had become natural in tone; while the singing voice had gained three notes upwards and four downwards. The bibliography of this condition was very meagre, and, so far as he knew, there were but three cases on record. These he then gave.

DR. M. J. ASCH, of New York, said that pertinent to the case of Dr. De Blois was a case he himself had had, in which he found a web occupying the anterior portion of the glottis, the result of acute inflammation. There was also a vertical web in one eye, stretching from the palpebral to the orbital conjunctiva. There was originally no laryngeal trouble, but the patient eventually became the subject of laryngeal phthisis.

DR. HARTMAN questioned the advisability of the introduction and forcible expansion of a pair of lateral forceps in the larynx, and said he would prefer the curved or tube bistoury, or the galvano-cautery, for division of webs.

DR. WM. H. DALY, of Pittsburg, read a paper on

GUNSHOT WOUND OF THE LARYNX, INVOLVING THE VOCAL BANDS.

In connection with a case which he related, he gave complete statistics and a bibliography of this injury. He had expected to present the patient, but the latter had found it impossible to attend.

DR. J. SOLIS COHEN stated that having had recent occasion to study the subject of gunshot wounds of the larynx, he had been astonished to find how infrequent they had been in military practice. He had had the opportunity of examining Dr. Daly's patient, and had at that time doubted if the ball had really traversed the larynx; but in view of the subsequent history of the case, he could not but admit that his previous opinion had been an incorrect one.

DR. LEFFERTS said that a specimen of gunshot wound of the larynx was in his collection in the museum of the College of Physicians and Surgeons, but, unfortunately, without history. The presence of a tracheotomy wound showed that the ball had remained in the larynx, and necessitated tracheotomy for dyspnœa.

DR. ASCH remarked that gunshot wounds of the larynx were extremely rare. As a medical officer of the United States Army for twelve years, and Acting

Medical Inspector of the Army of the Potomac during the Wilderness campaign of 1864, he saw not a single case of this character.

DR. J. SOLIS COHEN, of Philadelphia, reported

A CASE OF COMPLETE PARALYSIS OF THE LEFT VOCAL BAND IN EXTREME ABDUCTION, THE RESULT OF AN INCISED WOUND OF THE NECK.

The patient was thirty-three years of age, a drug-clerk, and a slave of the opium-habit. He was seen at the Jefferson Medical College, Philadelphia, in November, 1883, and said that in the June previous he had had his throat cut by thieves near Omaha. In attempting to cry out his voice gave way, and ever since there had been complete aphonia. While the right vocal band was normal in position, the left was found fixed in extreme abduction. On forced inspiration the right band did not go quite as far over as the position in which the left constantly remained. The man's account of himself was believed to be utterly unreliable, and there could be no doubt, from the position of the cicatrix in the neck (a plaster cast of which was exhibited), that he had attempted to commit suicide. The sterno-cleido-mastoid muscle had been severed, and the wound was deepest directly in the track of the pneumogastric nerve. There was no pulsation in the carotid artery, which was probably due to the fact that it was tied by the surgeon called to attend the man after the receipt of the injury. The wound was made from behind forwards, and there was a gashed appearance about the cicatrix, as though several slighter cuts had been made before the main one. The case, he believed, was altogether unique. Colored drawings were exhibited, showing the position of the vocal bands in inspiration, expiration, and forced inspiration.

DR. BOSWORTH remarked that he thought that this was the first case yet reported which would throw light on the subject of true abductor paralysis of the vocal bands, and the case was discussed by a number of other Fellows.

In the evening THE PRESIDENT, DR. BOSWORTH, gave a

RECEPTION

at his residence to the Fellows.

TUESDAY, MAY 13TH, SECOND DAY.

MORNING SESSION.

DR. F. H. HOOPER, of Boston, reported

A RARE FORM OF TUMOR (CAVERNOUS PAPILLOMA) OF THE VOCAL BAND.

The case was seen by Dr. Knight on November 22, 1882, but at that time refused all operative interference. The following year the case was referred to Dr. Hooper. The patient was a clergyman, thirty-two years of age, and said that the trouble commenced in September, 1882, when he suffered from a cold, with hoarseness. The cold lasted about three weeks, but the hoarseness continued persistently up to the time that the case came under observation. Apart from the hoarseness, there was no symptoms referable to the larynx, except a more or less constant scraping of the throat. A laryngoscopic examination revealed the presence of a small, nodular, sessile growth on the anterior portion of the left vocal band, about the size of a No. 7 shot. It presented some of the characteristics of a cystic tumor, but the diagnosis could not be determined with accuracy on inspection. At the patient's second visit, Fauvel's forceps were introduced, more for the purpose of testing the tolerance of the larynx than with any idea of removing the growth; but when the instrument was withdrawn and placed in a glass of water, much to Dr. Hooper's surprise, the tumor was found to have come along with it. It had been thus easily knocked off by the blade of the forceps, and had fortunately remained adhered to it. The hemorrhage was quite insignificant. The tumor (drawings of the microscopical sections of which were presented for examination) was referred to Dr. W. W. Gannett, Pathologist to the Massachusetts General Hospital, for examination, and he expressed the opinion that it was a cavernous papilloma. It contained a cavity which was filled with red blood-corpuscles, and he stated that he thought it had consisted of cavernous tissue from the start. The patient's voice was at once completely restored, and he left town for his place of residence the day following the removal of the growth.

Since then there had been no return of the trouble, and he had recently written Dr. Hooper that, during a series of special meetings lasting six weeks, he had spoken almost every night, and that his voice was "as good as ever." The only case of similar character that had as yet been reported, as far as the author was aware, was one described by Fauvel.

DR. CARL SEILER, of Philadelphia, stated that he also had had a case very similar to that of Dr. Hooper, with the exception that in his the epithelial structure was not as far developed as in the latter, the tumor being more of an angioma. The patient in whom it occurred was a student of elocution, and the only symptom of which he complained was hoarseness.

DR. MORRIS J. ASCH, of New York, reported

A CASE OF ENCHONDROSIS OF THE LARYNX.

Having stated that cartilaginous tumors of the larynx were very rare, he gave a complete *résumé* of the literature of the subject. There were only two cases, he said, in which the true character of the growth was recognized, and in but one of these was endolaryngeal methods of treatment employed. Dr. Asch's patient was forty-two years of age. He suffered from constant irritation of the throat, attended with hoarseness. He was an amateur vocalist, and the trouble in the larynx was a continual source of annoyance. The tumor was situated in the left aryteno-epiglottidean fold, and, on account of its marked hardness, Dr. Asch was enabled to make a correct diagnosis before its removal. This was accomplished by means of a modification of Stœrck's guillotine, in which the ring was made of well-tempered steel, with the cutting edges on the upper border. It was very difficult to get the tumor surrounded by the ring; but when this was finally accomplished the growth was removed without difficulty, and there was no hemorrhage. The restoration of the voice was complete, and the patient found that two notes were actually added to his register. The specimen was submitted for microscopic examination to Dr. George L. Peabody, Pathologist to the New York Hospital, who reported that each section of the tumor showed cartilage at the centre, and that it contained carbonate of

lime in considerable quantities. It was, therefore, a cartilaginous growth undergoing calcareous degeneration. He considered the case of interest to laryngologists, then, not only for the diagnosis, which showed it to be a very rare condition, but also from the fact that a cure had been effected by endolaryngeal methods.

DR. J. SOLIS COHEN said that he had never met with a case of this character in his own practice. In one or two instances he had thought he had to deal with cartilaginous growths of the larynx, but found subsequently that they were fibroids. He could hardly understand why the marked increase in the vocal register had followed the removal of the tumor, since the latter was situated outside of the vocal tract.

DR. SEILER thought it was perhaps due to increased resonance depending on the moral effect upon the patient from a sense of relief about the vocal apparatus.

DR. LANGMAID expressed the opinion that the increase in the voice was probably due, first, to the removal of irritation, and, second, to the feeling of enthusiasm on the part of the patient; and Dr. Asch agreed with him in this explanation.

DR. W. C. JARVIS, of New York, read a paper on

A NEW METHOD FOR THE REMOVAL OF LARYNGEAL GROWTHS.

In commencing, he said that the procedure to which he wished to direct attention on this occasion was the use of chromic acid for the removal of laryngeal papillomata. It was his practice to employ crystals of the acid fused on the point of a probe. The usefulness of this method depended on the affinity of this salt, which was properly the trioxide of chromium, for soft papillomatous tissues. The advantage of its action was that it was self-limited, and thus, as an escharotic, this agent was safe, harmless, and yet sufficient. It had a very restricted action on normal mucous membrane, and this added safety as a caustic agent.

There was a pronounced opinion in the minds of laryngologists, he continued, against the use of chromic acid, and he quoted a passage from Morell Mackenzie in opposition to its use. The reason for this unfavorable opinion, he thought, was on account of its improper employment on the part of certain operators, who had used it in such large quantities as to make its application both painful and dangerous. When properly employed, however, as he had found by experience, the salt, in the first place, enucleated the laryngeal growth, and, secondly, prevented the return of the neoplasm. One serious objection to the nitrate o silver was the tendency of its action on the tissues to spread; but the most important difference between chromic acid and the latter was its deliquescent character. The nitrate of silver, on the other hand, was wholly insoluble.

The great points in the successful use of chromic acid in this connection were tha it should be applied in small quantity, and the application frequently repeated. In making the application it was advisable to keep the point of the probe in the field of the laryngeal mirror, so that it could be directed with precision. The probe having been heated, a small quantity of the acid was placed upon it, and the papillomatous tissue was removed piecemeal. The curve of the probe, he thought, had much to do with the success of the procedure. As the use of the uncovered probe was sometimes attended with more or less difficulty, he had devised a canula provided with a spring, which was controlled by a trigger (instrument exhibited). The advantages of this were, first, that it prevented the chromic acid from coming in contact with the tissues before reaching the seat of growth; and, second, that it enabled the operator to surprise the larynx. It was so arranged that the force of the spring could be exactly regulated, and forcible impact of the caustic avoided.

The general applicability and utility of this method he thought very wide He then gave a history of the case in which he had first been led to adopt the treatment. The patient was a lady, thirty years of age, who was sent to him from Norwalk, Conn. She was suffering from more or less dyspnœa and frequently recurring spasm of the larynx. Her voice was a discordant whisper, and the laryngoscope revealed a very large growth, almost entirely filling the laryngeal cavity. By way of testing the tolerance of the parts, he introduced a probe, but it gave rise to such intense spasm that the patient's life seemed endangered. He proposed to perform tracheotomy, but as the patient would not entertain the thought of this, he determined to try the effect of applications of chromic acid. Accordingly, he resorted to this procedure, and was gratified to find that the caustic application produced neither spasm nor cough. He then applied the acid every day, and sometimes two or three times at a sitting, and at the end of nine days the patient recovered her natural voice. This was really as the result of five days' treatment, since during four of the nine days circumstances prevented the patient from attending. The treatment was commenced on the 14th of February, and was continued until the 4th of March; by which time every vestige of the tumor had disappeared, and he regretted very much that she was not present to show the result. (Dr. Jarvis exhibited large colored drawings of the growth.) He did not wish to exclude the use of the forceps and the snare, but at the same time he claimed that the opprobrium which had been cast upon chromic acid was unjust and unfounded.

In conclusion, he summed up the contents of the paper in the following propositions:

1. Trioxide of chromium, or chromic acid, is self-limited in its action. 2. It offers a safe and reliable means for the removal of large and small soft laryngeal growths. 3. It not only removes such growths, but also serves to prevent their return. 4. It is best applied fused on the point of a probe. 5. A tubular instrument can be employed to protect the tissues and guide the application. 6. Its use is not necessarily attended with pain and spasm. 7. It offers a substitute for tracheotomy and thyrotomy in certain cases in which these measures are ordinarily judged necessary.

DR. J. SOLIS COHEN said that it had been so long since he had used caustics for the removal of such growths from the larynx, that he had almost forgotten that he had ever done so. In such cases he had usually operated with instruments, but had sometimes applied escharotics afterward. He was glad that Dr. Jarvis had given such detailed directions for making the applications of chromic acid, as everything depended on the way in which the procedure was carried out. The results seemed to him very remarkable, and

he did not know of any other means which would have eradicated so large a growth as that described by Dr. Jarvis, in such a short time.

DR. ROE had sometimes employed chromic acid, but not until after the use of instruments. In one case of aphonia, of about eight years' standing, occurring in a patient eighteen years old at the time of coming under observation, he found a papilloma almost as large as the one described by Dr. Jarvis. He removed the growth by instruments, and then applied bichromic acid, for which he used a device somewhat similar to Dr. Jarvis's, in which the applicator was hid in a sheath. In several other cases he removed little nodules, and touched the bases with bichromic acid.

DR. SEILER said that he also had been using an instrument very similar to Dr. Jarvis's for surprising the larynx. It was provided with a pistol trigger, and its action was perhaps not as neat as that of the one now exhibited.

DR. INGALS, of Chicago, said that he sometimes resorted to a simple device for making a caustic applicator that was sufficiently protected for all practical purposes, and that was to take a piece of aluminium wire, and slip a piece of rubber tubbing, such as dentists use over its end. To make applications in certain positions it was sometimes advisable to cut out a piece of the rubber tubing at one side. He had used other caustics, but not chromic acid, in papillomatous growths. In one case of adenoid cancer, however, he was employing it freely, and without any bad results.

DR. MAJOR, of Montreal, said that in the case of infants and young children, he had found the use of absolute alcohol, applied by means of a spray, of very great advantage. While it would not perhaps remove large growths of the larynx, it would cause such shrinkage in them that tracheotomy could be dispensed with, and the patient got along comfortably until sufficiently large to have an operation performed for their removal, whether by caustic or otherwise.

DR. JARVIS said, in closing the discussion, that in many cases in which the size and position of the growth were such as to produce intense spasm, instrumental interference was out of the question, on account of the danger of bringing on a fatal result; but when the growth was not sufficiently large to cause reflex spasm, instruments could be used with impunity, whether a certain amount of irritative spasm be produced or not.

THE PRESENTATION OF INSTRUMENTS

being now in order, among those exhibited were a nasal speculum, by Dr. Mackenzie; a tonsillitome, with three blades, and a new uvulatome, by Dr. S. Solis Cohen; and an apparatus for artificial feeding, by Dr. Delavan.

SECOND DAY—AFTERNOON SESSION.

THE PROPOSED NEW NOMENCLATURE

was in order for discussion, but, on motion of Dr. Knight, of Boston, the matter was referred to the Council for consideration, after which it was to be reported for adoption.

DR. D. BRYSON DELAVAN, of New York, then read a paper on

PERMANENT UNILATERAL PARALYSIS OF LARYNGEAL ABDUCTORS, FOLLOWING CEREBRAL HEMORRHAGE; UNIQUE CASE.

The case was one which, he thought, would be of interest to the Association, not only on account of its extreme rarity, but also as affording an opportunity for the discussion of the vexed and unsettled question of the etiology of abductor paralysis. The only distinct reference to this lesion which he had been able to find in the whole range of medical literature, was in Nothnagel's article on cerebral hemorrhage in *Ziemssen's Cyclopædia*, in which he simply says that unilateral paralyses of the vocal ends are exceedingly rare. The patient who was the subject of the affection was a gentleman sixty-nine years of age, who belonged to a long-lived family, in which there were, however, some tubercular and rheumatic tendencies. He was of temperate habits, but used tobacco freely. Since middle life he had suffered more or less constantly from rheumatism, and he was also troubled at times with pharyngeal catarrh. In 1876 he had a seizure which was apparently of a vertiginous nature, from which he recovered promptly, without any bad consequences; but in 1877 he had a well-marked apoplectic stroke. This was followed by complete hemiplegia, and, in addition to this, his voice assumed a cracked, piping, and uncertain tone. There was also facial paralysis, with distinct ptosis. For several months there was a slow but steady improvement, until all trouble disappeared, except that in connection with the voice, which remained practically the same.

In 1882, Dr. Delavan first had an opportunity of making a laryngoscopic examination, and he found that there was complete paralysis of the right laryngeal abductors, the vocal band of that side lying directly in the median line. This condition had now lasted for seven years. From the paralysis of the laryngeal abductors occurring at the same time and apparently in connection with hemiplegia, the result of cerebral hemorrhage, it would seem at first sight to establish the existence of independent ganglionic centres for the abductors; but the fact that all the other paralyses disappeared after a time, while this abductor paralysis remained permanent, certainly militated against such a hypothesis, though it did not positively exclude it.

DR. KNIGHT considered this matter of abductor paralysis a subject of interest, but doubted whether any of those present were prepared to add anything new in regard to it. He had, however, seen one case which seemed very pertinent to the paper. It was that of a patient who fell down stairs, striking his head, and whose voice was at once found to have become entirely altered in tone. This was the only trouble from which he suffered, and the examination of the larynx showed paralysis of the abductors. There must, therefore, have been some lesion which affected the abductors without implicating the adductors,—probably an injury to either the nerve or the nerve-centre.

DR. DELAVAN remarked, in conclusion, that he had simply offered a clinical fact, which he trusted might add a mite to our knowledge on this obscure question, and that he had no theory of his own to advance.

DR. R. P. LINCOLN, of New York, reported a case of

STRICTURE OF THE ŒSOPHAGUS.

The patient was a native of Hayti, fifty years of age,

and was referred to him by Dr. F. N. Otis, in June, 1883, when he was suffering from aphonia, dyspnœa, dysphagia, regurgitation of food into the nares, and more or less constant pain. These troubles had commenced, he said, eighteen months previously.

An examination showed him to be suffering from rhinitis, pharyngitis, and laryngitis, and he said that he had been previously treated for syphilitic laryngitis by the internal administration of iodide of potassium and locally by the application of nitrate of silver, tannin, etc. Inspection showed a general fulness of the neck, extending from the cricoid cartilage down to the clavicle; while the thyroid body was considerably enlarged. The epiglottis was red and thickened, and there was stenosis of the larynx. There was extreme sensitiveness of the pharynx and larynx, and no attempt was made at this time to pass sounds into the œsophagus. The presence of a stricture of the latter was indicated opposite the seventh cervical and first dorsal vertebræ on auscultation when the patient swallowed fluid. He was placed on the use of iodide of potassium, while oleate of mercury was rubbed into the enlarged cervical glands, which became softened and less sensitive, though they did not diminish in size. At the same time local applications were made, by means of spray, to the pharynx and larynx, and his whole condition became considerably improved. Afterwards, however, he grew worse, and the skin was noticed to be somewhat cyanosed, while he also suffered from delusions.

Under the use of steam inhalations and hypodermic injections of morphia, he again improved, though the obstruction to deglutition still continued. The attempt to pass sounds or bougies was always followed by inflammation; but once Dr. Lincoln succeeded in introducing a metallic sound. Severe inflammation followed, but later, Dr. Weir passed a bulb-pointed catheter without occasioning any inflammatory trouble. For a time, he seemed considerably relieved, receiving three nutrient enemata a day, in addition to hypodermic injections of cod-liver oil; but in September he died. The autopsy showed that the disease was medullary cancer. It began in the anterior wall of the œsophagus, and the cervical glands, as was usual in such instances, shared in the affection. The vagi nerves were implicated, and death resulted from interference with the cardiac branches of the same.

DR. ROE suggested that the bougies should have been left *in situ*.

DR. DALY thought that gastrostomy migh have been tried.

DR. DONALDSON stated that he could not think it necessary to resort to gastrostomy in cases of stricture of the œsophagus from adhesive inflammation resulting from caustic fluids, as had been recommended by some. He related a case occurring in a child two years of age, who swallowed concentrated lye; when in two weeks it was found that there were two strictures of the œsophagus, one about the seventh cervical vertebra, and the other near the cardiac orifice of the stomach. Soft œsophageal bougies were introduced more or less continuously for over two years; the tube being thereby kept open. Should he have another similar case, he would keep the œsophagus open by allowing a perforated tube to remain in it, as had been done by others.

DR. LINCOLN closed the discussion, and said, in reply to Dr. Roe's criticism, that it should be borne in mind that any attempt at interference with the œsophagus, at least any sufficient to pass a sound, was always followed by great inflammatory reaction. Moreover, there was a prompt improvement, attributable, apparently, to the soothing treatment at first instituted, which seemed to justify its continuance. In regard to Dr. Daly's suggestion, that gastrostomy might have been tried, he wished to say that while the statistics of operations so far reported gave but little encouragement for its adoption in any case, certainly the sequel in this instance showed that it would have been useless; the cause of death having been pointed out to have been due to implication by the disease of the cardiac branches of the vagus.

DR. E. FLETCHER INGALS, of Chicago, read a paper on

TRACHEAL STENOSIS.

During the past year he had met with three cases of this affection (all due to syphilis), which he related in detail. The first patient, after making a fair amount of improvement, died, his decease being attributed, to asthma. In this case, Dr. Ingals said, life was undoubtedly prolonged for many months by the use of large doses of iodide of potassium, which he recommended very highly in this kind of trouble. In the second case this acted so favorably that there had been no return of the severe symptoms, which were at no time urgent, and the patient was able to attend to business regularly. In the third case it was necessary to perform tracheotomy.

The following were elected

OFFICERS FOR THE ENSUING YEAR:

President.—E. L. Shurley, M.D., of Detroit.

Vice-Presidents.—Drs. J. H. Hartman, of Baltimore, and Wm. H. Daly, of Pittsburg.

Secretary and Treasurer.—Dr. D. Bryson Delavan, of New York.

Librarian.—Dr. T. R. French, of Brooklyn.

Council.—Drs. F. Donaldson, of Baltimore, and F. H. Bosworth, of New York.

THE ANNUAL DINNER

of the Association was given at the University Club.

MEDICAL SOCIETY OF THE STATE OF PENNSYLVANIA.

Thirty-fifth Annual Session, held at Philadelphia, May, 14, 15, and 16, 1884.

THE Society was called to order in the Hall of the Union League by THE PRESIDENT, DR. HENRY H. SMITH, of Philadelphia.

The register of delegates, numbering two hundred and fifty, was accepted without being read.

THE ADDRESS OF WELCOME

was then delivered by DR. J. B. ROBERTS, Chairman of the Committee of Arrangements, who, on behalf of the Philadelphia County Medical Society, extended a cordial greeting.

THE PRESIDENT then introduced the GOVERNOR OF PENNSYLVANIA, HON. ROBERT E. PATTISON, who in a few remarks said that Pennsylvania derives exceptional honor from the character and reputation of her medical profession. Its ranks are full of great names and its history with great achievements. You have wisely chosen

Philadelphia as a meeting-place, and while here, your Society may be regarded as set upon a hill. It should be remembered that it was here that the first system of medical study was formulated in this country, and from this has sprung the present University of Pennsylvania. Philadelphia may be regarded as the Odessa of medicine; she has sent forth many great men, among them one whose death I greatly deplore, a man honored by Oxford and Cambridge, Prof. S. D. Gross, by whose death the medical fraternity has suffered a great loss. The history of medicine is the history of the human race, and its progress is reflected as man progresses from idolatry to enlightenment. There is no other profession that demands of its members, so urgently and pressingly, that its members shall be distinguished by great learning, devoted sincerity, and spotless honor as this. I hope, for the sake of this Commonwealth, that the results of this session may be to the advantage of the medical profession in Pennsylvania.

THE COMMITTEE ON PUBLICATION

presented the following:

Resolved, That in future no paper read before the Pennsylvania State Medical Society shall be printed in the *Transactions* if they have been published elsewhere, unless such previous publication shall have been simply in abstract.

The resolution was referred to a special committee, with instructions to report the following day. Drs. Traill Green, Stewart, Wood, of Allegheny, Allis, and Purcell were appointed the committee.

THE MEDICAL EXAMINERS OF COUNTY SOCIETIES

reported that twenty men had applied for examination; of these thirteen passed and seven were rejected.

THE REPORT OF THE COMMITTEE ON THE APPEAL OF THE AMERICAN ANTI-VIVISECTION SOCIETY

was presented by DR. S. WEIR MITCHELL, Chairman. It recited the bad effects in England of the interference of a similar society there in securing legislation hostile to original investigation. The operation of the English law has put an end to physical research. One eminent physician who has been investigating snake poisons has been obliged to give up his inquiries, and this in face of the fact that from 25,000 to 30,000 people are killed in India every year by snake bites, and the Indian Government has actually sent snake poison to Philadelphia, and money, also, to secure investigation, not being able to have such researches made in England. In the latter country, of forty-seven eminent and skilled men who were asked as to the value of vivisection, forty-five answered in favor of it, and only two against it, and in a convention in London in 1881, twenty-four hundred of the most learned physicians pronounced that experimentation upon living animals was indispensable to the future progress of medicine, and it was not desirable to restrict such experiments. It told the members that efforts will be made in the Legislature to pass an anti-vivisection law, and each of them ought to see that such a bill is defeated, and not have our great medical schools crippled, as they have been in England. In Washington, recently, at the American Medical Association, a unanimous vote was recorded against restriction. The report recommended the adoption of the following resolution:

Resolved, That in view of the attempts which have been or may be made to obstruct, by restrictive legislation, the progress of experimental medicine, this Society desires to express its earnest conviction that experimentation on animals is a most useful source of knowledge in medical science; that it is the means by which many important discoveries, both practical and scientific, have been accomplished; that its direction and supervision can be properly entrusted only to members of the medical profession, and that its restriction or prohibition by law would inevitably retard the acquisition of knowledge in respect to healthy and morbid actions, the causes and prevention of disease, and the improvement of the medical art.

The report was adopted unanimously and the Committee continued, to urge the views of the Society on the Legislature.

The amendment to By-laws, Article V., offered by Dr. Henry Leffmann, on behalf of the Philadelphia County Medical Society: Add as Section 8: "No paper shall be read before this Society unless the same has been previously read, either in full or in abstract, before a County Society, and by it referred to this Society," was indefinitely postponed.

MISCELLANEOUS BUSINESS.

A resolution was adopted recommending the passage of a law preventing the adulteration of drugs and medicinal preparations, as recommended by the Pennsylvania Pharmaceutical Association.

A resolution to appoint a committee to take action in regard to legislation looking to the regulation of the sale of alcohol was lost.

AFTERNOON SESSION.

THE ADDRESS IN HYGIENE AND STATE MEDICINE

was delivered by DR. BENJAMIN LEE, of Philadelphia. He took for his subject, *The Present Outcome of Sanitary Agitation in Large Cities in the United States.*

In no department of governmental supervision do the United States of America make so poor a showing, as in that of the care of the public health. With limited areas and in small communities, much may be accomplished by private effort, and this fact hygienists have not been slow to appreciate. A go-between was needed to interpret their teachings to the masses, and impress upon them their importance. This agency has developed itself in voluntary sanitary associations, modelled upon one started in the ancient and filthy city of Edinburgh. The first in this country was started in Newport, Rhode Island. This was followed by a second in Lynn, Mass., and a third in Orange, N. J., then in rapid succession by others in other cities and villages, until now there are not less than a hundred and seventy in active and beneficent operation throughout the country, that of Brooklyn, L. I., being the largest and most important. The objects of these associations are, first, self-protective, by indicating, as far as may be, sanitary defects and dangers in the homes of their members, and of neighbors of their members, suggesting remedies for such defects, and urging their application; and secondly, educational, (*a*) in the most practical way by actual demonstration of the necessity for, and the benefits of, sanitary science, as above stated, and (*b*) by the dissemination of popular tracts expressed in simple, intelligible, and forcible language, giving both general

information and practical hints in detail as to the sanitation of the dwelling. Such an association is in reality a mutual insurance company for the preservation of private and public health. It is not intended as a substitute for municipal inspection, and will not conflict with the public health authorities, where such exist, but will supplement their action.

DR. E. A. WOOD, of Allegheny, then spoke concerning the importance of organizing a

STATE BOARD OF HEALTH.

Ignorance and prejudice, he said, were the chief obstacles in the way. The community would have to be educated to know and see the dangers before they would try to remedy them. He thought that disease had had its sway too long, and that the true treatment of many diseases dependent on a special germ was the stamping out of the germ.

DR. HENRY LEFFMANN, of Phila., read a paper on

PROPER MEDICAL EDUCATION.

The present system of medical education is not the result of efforts to meet the needs of the community, but is largely an irregular development. The reforms which medical colleges have adopted have been mostly unwilling concessions to public sentiment, and the extension and success of post-graduate schools indicate the direction in which the improvement of the curriculum should be made. A preliminary training for the student before entering on the study of medicine, is so obviously necessary that it need not be argued. The final work of medical reform will be accomplished when the college is made merely the instructor, the license to practise being given by an official board of examiners, after a written public examination.

DR. THOMAS H. FENTON, of Philadelphia, spoke on

HYGIENE IN THE PUBLIC SCHOOLS,

in which he presented the following indictment. The locations of buildings were often on small streets; the houses crowded closely together; the ventilation was poor, or *nil;* the drainage bad; the illumination poor, and not managed according to the best scientific principles; the hours of study too long, and the hours of play too short.

DR. ALICE BENNETT, of Montgomery Co., then delivered the *Address on Mental Disorders*, and choose for her subject,

THE RELATION OF HEART DISEASE TO INSANITY.

The physiological mode of action of brain- and nerve-cells being utterly unknown to us, the manner in which such action may be modified can be but a matter of conjecture. But it is not unreasonable to suppose that irregularities of the circulation, such as are common in organic heart disease, may have an influence in modifying the action of an organ so peculiarly open to impressions as the brain, and whose anatomical connections with the heart are direct and intimate.

Of 500 cases examined in the female department of the Hospital for the Insane at Norristown, taken without discrimination, there were found 101 abnormal hearts, classified as follows: simple irregularity, 11; hypertrophy and dilation, 4; apex systolic murmur, 70; with basal systolic, 16.

Feeble action of the heart was noted among the advanced dements. There was also a very general absence of hæmic murmur. But it is to the coincidence of heart disease with a certain form of chronic mania to which this paper is specially designed to call attention. The histories of sixteen cases possessing similar features, and all presenting evidence of mitral disease, were then given. These cases constitute a distinctive class, easily recognized by the merest novice.

Some of the general features are as follows: They begin generally in middle life. The invasion is gradual, generally ascribed to no cause, or to one obviously inadequate. The first symptoms are invariably hallucinations of one or more senses, generally of hearing, and subsequent delusions of persecutions.

Among this class we find some of the most quiet inmates of our hospitals; some, not obviously insane to casual observation, who have remained in stationary conditions for years; others, beginning in the same way, show a tendency progressing toward a general misconception of all the facts of their daily life. In four of the cases delusions as to identity were present.

Another series of twenty-four cases present salient features characteristic of this class, although not so typical and unmixed as those given above. All have hallucinations of hearing, and all have disease of the heart, generally mitral insufficiency.

Of the forty-seven cases of chronic mania found to have heart disease, forty are mentioned above; of the remaining seven, two began as violent acute mania; three are of a recurrent type, consisting of paroxysms with general incoherence and mixed delusions; one is of unknown history and has delusions relating to wealth. In none are hallucinations known to be present. It is only fair to look at the one hundred and one cases of chronic mania showing no cardiac disease. The list comprises a great variety of conditions. A number began as violent acute attacks that have never recovered. These show all kinds of delusions; generally changing and transitory, and there are some hypochondrical and hysterical cases; a number are traced to the use of alcohol. Very many have an unknown history.

A careful examination of the whole number shows only three cases which bear any resemblance to those given above. One of these is deformed by disease of the spine; she has made homicidal threats in consequence of supposed injuries. One has progressing phthisis, and her insanity was attributed to alcohol; of the third nothing is known except that she goes about beating the walls with her shoes, probably under the influence of hallucinations.

It is not my intention to draw any inference from the above cases, which I do not offer as anything more than a rather remarkable series of coincidences. It has only been shown that among five hundred patients, a certain distinctive form of mania has been found, almost without exception, associated with valvular disease of the heart, generally mitral. Whether the "frequency of the coincidence" justifies the suspicion of a causal relation, is for you to determine. Admitting the suspicion, it must be verified, or the reverse, by continued observations.

DR. R. N. CHASE, of Montgomery County, then read a paper entitled

THE PROTECTIVE RIGHTS OF THE INSANE IN PENNSYLVANIA.

He contrasted the old and barbarous system of abuse

with our present treatment. He ascribed the first movement of reform to Tuke, in 1792, and traced it up to the present time. He reviewed the laws regulating the visits of boards and friends of the patient; explained that patients confined must be supplied with materials for writing to friends and relatives; that notices of the rights of patients should be posted in such places as could be easily seen and read by them; that their letters must be sent promptly, or the reason for failure written on outside of envelope, and that under no pretence was a letter to the patient's attorney or to the Board of Lunacy to be delayed; that abuses by those in charge should be dealt with according to law; that the beds, food, etc., were under the inspection of the Board; that reports on deaths, escapes, etc., were rigidly reported; and, lastly, that in no State or country were the rights of the insane better protected than in Pennsylvania,

DR. J. B. ROBERTS, of Philadelphia, offered a resolution that the Nominating Committee appoint a committee of seven to secure a charter for

A NEW MEDICAL COLLEGE,

to be known as the Pennsylvania Medical College, and to be situated in either Philadelphia or Allegheny County. Said college to have a preliminary examination, and a graded course of three years. Said college to be put in operation only on the condition that the present colleges do not adopt a preliminary examination by that time. This resolution was laid over.

The following were elected

OFFICERS FOR THE ENSUING YEAR:

President.—E. P. Allen, M. D., of Bradford.

Vice-Presidents.—Drs. Jacob Price, of West Chester; D. W. Bland, of Pottsville; C. Brandes, of Erie; and S. R. Rutledge, of Blairsville.

Permanent Secretary.—Dr. W. B. Atkinson, of Phila.

Recording Secretary.—Dr. A. J. Cornell, of Lackawanna.

Corresponding Secretary.—Dr. John G. Lee, of Phila.

Treasurer.—Dr. Benjamin Lee, of Philadelphia.

Committee on Publication.—Drs. R. J. Dunglison, H. Leffmann, of Phila., and E. Jackson, of West Chester.

Judicial Council.—Drs. Traill Green, of Easton, J. A. Ehler, of Lancaster, and W. T. Bishop.

Next Place of Meeting.—Scranton. *Time.*—Second Wednesday in May, 1885.

Chairman of Committee of Arrangements.—Dr. J. F. Everhart. Associates to be chosen by the Lackawanna County Society.

NEWS ITEMS.

WASHINGTON.

(From our Special Correspondent.)

YELLOW FEVER NOTES.—Sanitary Inspector Burgess, U. S. M. H. S., reports from Havana that there were 490 deaths in that city during the month of April, 34 of which were from yellow fever, 11 from typhoid fever, and 17 from pernicious fever. Of the 34 deaths from yellow fever, 18 occurred in the military hospital, and the remaining 16 in civil circles. Thirteen deaths from yellow fever are reported by him as having occurred during the first week in May.

Surgeon Murray, U. S. M. H. S., in charge of Ship Island quarantine, reports the arrival and disinfection of one vessel each from Rio and Colon, the latter with a clean bill of health.

The Secretary of State has received information, through the consulate at Maracaibo, that the reported epidemic of yellow fever at Cucula, Venezuela, in which it was stated that 1170 deaths occurred in a few days, is incorrect, an investigation made into the facts showing but 126 deaths in four months from this disease.

LONDON.

(From our Special Correspondent.)

TUBERCULAR TUMORS OF THE LARYNX.—At the meeting of the Clinical Society of London held on Friday, April 18th, DR. PERCY KIDD read a paper on tubercular tumors of the larynx. When the patient was first seen the signs of pulmonary mischief were but ill-defined; the laryngeal symptoms were predominant. It is needless to go into the details of this most interesting case; the main feature was the presence of *tumors* in the larynx of undoubtedly tubercular structure; moreover, notwithstanding the great tendency of tubercular formations to undergo caseation and ulceration, the growths in question remained as tumors for a period of no less than nine months. Dr. Percy Kidd discovered the characteristic bacilli in the laryngeal growths.

SIR ANDREW CLARK suggested that a fibrous degeneration of the tubercles might have prevented the development of ulcers, but Dr. Kidd said there was no appearance of fibroid tissue which would justify that opinion. The size of the tumors was about that of a pea; their situation was about the processus vocales. Schnitzler, it appeared, had described a similar case; but, with that exception, Dr. Kidd had searched literature in vain. Since his paper was written, however, he had met with two somewhat similar cases, in which the larynx was the seat of tubercular tumors, but the delay in ulceration was by no means so great.

EXCISION OF THE RECTUM FOR EPITHELIOMA.—The paper on this subject, by MR. HARRISON CRIPPS, excited considerable discussion. The general opinion of the surgeons was to the effect that operation for rectal cancer was decidedly to be recommended. Differences, of course, were mentioned in the modes of procedure.

MR. WALSHAM preferred to use the scissors, and considered that, even though the total extirpation of the disease could not be practised, yet the removal of as much as possible was a good procedure. Contraction of the calibre of the rectum and incontinence of feces were no doubt the great troubles which the surgeon had to contend with after the operation.

MR. BARKER thought that where the entire circumference of the rectum was not taken away, the result was better; for, as in an instance quoted, although the contraction might seem as great, yet practically the obstruction was much less, owing to the slight preservation of normal rectum. It appeared that a valvular arrangement was produced by the retention of a portion of the circumference of the normal rectum.

SIR ANDREW CLARK said that in his experience

cancer of the rectum was not so rapidly fatal a disease as text-books would have us believe. He spoke of a case which had lasted for eight years.

MR. HARRISON CRIPPS did not agree with Sir Andrew's observation, but he mentioned that in one of the cases on which he had operated the patient was alive eight years after the surgical treatment.

MR. RICKMAN GODLEE advocated the use of Pacquelin's cautery. He also referred to a case in which repeated scraping seemed to have prolonged life.

TUBERCULAR MENINGITIS.—DR. ANGEL MONEY reported the case of a female infant, aged nine months, who had a "fit," followed by hemiplegia of the left side, one month before she was first seen. There were no other signs or symptoms of disease except the hemiplegia at this period. The baby was extremely fat. Two or three weeks later the "fits" recurred, the breathing became changed in rhythm, and on the last day of life the temperature rose to 107.7°. The presence of ankle clonus was mentioned as interesting. At the autopsy there was a great amount of disease in the form of tubercular meningitis. The cause of the hemiplegia was, however, thrombosis of a large branch of the right middle cerebral artery. This thrombosis might have been produced by the meningitis, or might have been the result of embolism, seeing that Dr. Angel Money discovered a duckweed-like growth on the smaller flap of the mitral valve. The other organs of the body gave evidence of a general tuberculosis.

In the discussion of this subject, Drs. Glover, Heron, and Tonge Smith referred to cases of evanescent paralysis.

ASSOCIATION OF MEDICAL SUPERINTENDENTS OF AMERICAN INSTITUTIONS FOR THE INSANE.—The thirty-eighth annual meeting of this Association was held at the Continental Hotel, in the city of Philadelphia, commencing on Tuesday, May 13, 1884,

The following addresses, commemorative of the Fortieth Anniversary of the Association, were delivered.

History of the Association and its Necrology, by Dr. John Curwen.

Causes of Insanity in America, by Dr. G. A. Shurtleff.

Progress in the Treatment of the Insane, by Dr. H. P. Stearns.

Progress in Provision for the Insane, by Dr. W. W. Godding.

Progress in the Pathology of Insanity, by Dr. Daniel Clark.

MEDICAL SOCIETY OF NEW JERSEY.—The next annual meeting of the Medical Society of New Jersey will be held in the Stockton House, at Cape May City, on Tuesday and Wednesday, June 10 and 11, 1884. The address by the President, Dr. J. Wicks, will be delivered Tuesday evening. A complimentary train, for the physicians and their families, will leave Camden for Cape May on Tuesday at 12 o'clock M.

COLLEGE OF PHYSICIANS AND SURGEONS OF NEW YORK.—At the seventy-seventh annual commencement of the College of Physicians and Surgeons of New York, held on May 13, the degree of M.D. was conferred upon one hundred and five graduates. The Alumni prize of five hundred dollars was awarded to Dr. M. Allen Starr, of New York.

ILLINOIS STATE MEDICAL SOCIETY.—The thirty-fourth annual session of this Society will convene in Chicago on May 20th.

COLUMBUS MEDICAL COLLEGE.—The annual commencement of this school was held on March 7th. Diplomas were conferred upon thirty-five candidates.

STARLING MEDICAL COLLEGE.—At the thirty-seventh annual commencement of this school, held on March 5th, twenty-five candidates received the degree of M.D.

TRICHINOSIS IN GERMANY.—It is officially stated that last year, at Ermsleben, a small town of Prussian Saxony, four hundred and three persons were seriously ill, and sixty-six died from trichinosis. The disease was caused by eating raw pork, which all came from one hog.

ACTION OF THE FACULTY OF JEFFERSON MEDICAL COLLEGE ON THE DEATH OF PROF. S. D. GROSS.—

THE JEFFERSON MEDICAL COLLEGE OF PHILADELPHIA.
Thursday, May 8, 1884.

The Faculty have learned with profound sorrow the death of their late colleague, the Emeritus Professor of Surgery, Dr. Samuel D. Gross. First as a student within its precincts, and afterwards its most eminent professor, his career constitutes one of the chief glories of this College. He was alike distinguished in all the fields of intellectual activity open to the medical profession. As a practitioner of surgical art, as a teacher and professor of surgery, and as author of a great surgical treatise, he stood in the front rank of the world's great men devoted to these pursuits. Whilst we thus do homage to his mental powers, we are not less appreciative of those admirable personal traits and social gifts by reason of which he endeared himself to the whole body of the medical profession.

We offer to his family our sincerest condolences on their irreparable loss. In testimony of the reverence in which we hold his memory, we cause this memento of our grief to be entered on the minutes of the Faculty, and it is hereby ordered that the large painting of the deceased Professor, now in the Faculty-room, be draped in mourning.

By the Faculty,
ROBERTS BARTHOLOW, M.D.,
Dean.

OFFICIAL LIST OF CHANGES IN THE STATIONS AND DUTIES OF OFFICERS SERVING IN THE MEDICAL DEPARTMENT, U. S. ARMY, FROM MAY 6 TO MAY 12, 1884.

WEBSTER, WARREN, *Major and Surgeon.*—Granted leave of absence for six months, from April 29, 1884 on account of sickness.—*Par. 5, S. O. 103, A. G. O.*, May 3, 1884.

STERNBERG, GEORGE M., *Major and Surgeon.*—Now at Governor's Island, New York harbor, ordered to repair to this city (Washington, D. C.), to represent the Medical Department of the army at the annual meeting of the American Medical Association, to meet on May 5, 1884, and, on adjournment of the Association, to return to Governor's Island.—*Par. 2, S. O. 103, A. G. O.*, May 3, 1884.